From school to work:

The role of the vocational specificity of education in young people's labor market integration

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Design/Lay-out
Proefschriftenbalie, Nijmegen

Print
Ipskamp Printing, Enschede

ISBN 978-94-6421-359-1

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Proefschrift

ter verkrijging van de graad van doctor
aan de Radboud Universiteit Nijmegen
op gezag van de rector magnificus prof. dr. J.H.J.M van Krieken
volgens besluit van het college van decanen
in het openbaar te verdedigen op 21 juni 2021
om 12.30 uur precies

door

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CHAPTER 1

Synthesis

1.1 Introduction

The transition from school to work is pivotal in the lives of young adults. It is an important step towards adulthood and strongly connected with other steps, such as leaving the parental home (Scherer, 2005; Wolbers, 2007a). Education plays a key role in preparing young people for and allocating them to the labor market. One institutional feature that particularly garners attention in the school-to-work literature is the vocational specificity of education, which refers to the extent to which educational programs prepare students for specific occupations and provide them with job-relevant skills that are in demand by employers (Allmendinger, 1989; Blossfeld, 1992; Shavit & Müller, 1998). This body of research has clearly established that the vocational specificity of education can have an influence on school-leavers' labor market outcomes through processes at the level of educational systems, educational programs, and individual school-leavers (Bol et al., 2019; Blommaert et al., 2020; DiPrete et al., 2017; Raffe, 2008, 2014; Rözer & Van de Werfhorst, 2020). By investigating each subsequent level at which the vocational specificity of education can manifest itself, I aim to gain better understandings of the vocational impact on young people's integration into the labor market. Accordingly, the central aim of this dissertation is to examine the influence of the vocational specificity of education on the micro, meso and macro level on young people's labor market outcomes. It thereby provides an overview of and more nuanced insights in how the vocational specificity of education on different levels are related to youth's labor market integration.

The vocational specificity of educational systems does not have a set definition; a variety of conceptualizations have been used to denote this feature of the educational system. It has, for example, been described as the extent to which educational programs emphasize job-specific as opposed to general skills in upper secondary education (e.g. Heisig & Solga, 2015), but also as the degree to which the institutional linkages exist between (vocational) education and employers or organizations in the labor market (e.g. DiPrete et al., 2017; Wolbers, 2007a). For the sake of clarity, I will call this feature of the educational system 'vocational specificity' throughout my dissertation and adhere the abovementioned definitions, but comparable terms are also prevalent in the literature, such as 'vocational orientation' (e.g. Van de Werfhorst, 2011a) and 'occupational specificity' (e.g. Shavit & Müller, 2000). Some studies use these different terms interchangeably (e.g. Andersen & Van de Werfhorst, 2010; Scherer, 2005), while others use different terms to indicate distinct features (e.g. Levels et al., 2014). For example, 'vocational orientation' often refers to the share of vocational enrolments within upper secondary education, whereas 'vocational specificity' refers to the share of upper secondary vocational education that takes place in the form of a combination of school-based and workplace-based learning, or – in other words – a dual system (see Bol & Van de Werfhorst, 2013). The term I use ('vocational specificity') does not necessarily refer to these dinstinct features or measurements, unless stated otherwise. At the level of educational programs, vocational specificity typically refers to the extent to which educational programs provide students with job-

specific skills and prepare them for a narrow set of occupations (Forster & Bol, 2018). At the individual level, it typically refers to the extent to which students acquire either more general skills or more job-specific skills (Arum & Shavit, 1995; Forster, Bol, & Van de Werfhorst, 2016; Scherer, 2005; Van de Werfhorst, 2011a).

Even though the impact of the vocational specificity of education runs through at least three levels, research on the impact of vocational education on youth labor market integration typically focuses on one, or a subset of these levels. As a result, theoretical insights and empirical evidence are fragmented. Furthermore, focusing on one level may lead to an incomplete or at worst an erroneous view, as different processes and underlying mechanisms can manifest themselves at different levels, and also the impact of the vocational specificity of education may differ across the three levels. A pivotal step in improving current understandings is therefore to provide more structured insights into the role of the vocational specificity of education on youth's labor market integration by paying explicit attention to the three levels through which the vocational specificity of education operates. To provide more comprehensive insights into the vocational impact on the school-to-work transition, I will investigate the following five common indicators of labor market integration (for an overview see Blommaert et al., 2020): paid employment (e.g. Shavit & Müller, 2000; Wolbers, 2007a), immediate job entry after graduation (e.g. Barbieri, Cutuli, & Passaretta, 2016; Scherer, 2005), permanent employment (e.g. De Lange, Gesthuizen, & Wolbers, 2014; Van der Velden & Wolbers, 2007), wages (Dieckhoff, 2008; Van de Werfhorst, 2011), and experiencing a horizontal job match (i.e. matching to the field of education) or a vertical job match (i.e. matching to the level of education) (e.g. Levels et al., 2014; Wolbers, 2003).

Moreover, while it is widely known that adverse macro-economic conditions negatively affect youth's opportunities in the labor market (e.g. De Lange et al., 2014), conspicuously little is known about the extent to which macro-economic conditions influence the relationship between the vocational specificity of education and youth's integration into the labor market. Are more vocationally specific educational programs a blessing or a curse for school-leavers in countries or regions with higher aggregate unemployment rates? On the one hand, it can be argued that school-leavers from highly vocational programs may less easily divert to other occupations (Coenen, Heijke, & Meng, 2015; Protsch & Solga, 2016). On the other hand, school-leavers from highly vocational programs may have a monopoly on the occupations they are specialized in and optimally prepared for, even when demand is low (Collins, 1979; Weeden, 2002). In a nutshell, I aim to illuminate whether the vocational impact is either stronger or weaker in countries or regions where aggregate unemployment rates are higher.

All in all, the central aims of this dissertation result in the following two research questions: *To what extent does the vocational specificity of education at the micro, meso and macro level relate to young people's labor market outcomes, and to what extent does this relationship*

vary with macro-economic conditions? Accordingly, in Chapter 2 of this dissertation, I start by providing a literature review that gives an overview of the theoretical insights and empirical evidence of the vocational impact on youth's labor market integration at the three levels through which the vocational specificity of education operates. I also provide an overview of different indicators of the vocational specificity of education on all three levels prevalent in current literature. Subsequently, I zoom in on the impact of the vocational specificity of education at each level in three empirical chapters. In Chapter 3, I zoom in on the role of vocational specificity of education on the micro-level, which I measure through the job-specific skills and educational signals of recent school-leavers. In Chapter 4, I hone in on the impact of vocational specificity of educational programs while simultaneously taking into account the skills and educational signals that are under investigation in Chapter 3. Lastly, in Chapter 5, I investigate the role of vocational specificity at the level of educational systems, while also taking into account the within-country heterogeneity in vocational specificity between educational programs, as well as the skills and educational signals of the young people under investigation.

This chapter synthesizes the empirical chapters. The sections are organized as follows. Section 1.2 elaborates on the outcomes and lacunas in previous research as well as the contributions of this dissertation to the literature at each of the three levels, specifically. Section 1.3 summarizes the aims, theoretical underpinnings and conclusions of each empirical chapter. Lastly, Section 1.4 provides a general conclusion and discussion of this dissertation, followed by the policy implications in Section 1.5.

1.2 Previous research: main findings, lacunas, improvements

1.2.1 The vocational specificity at the micro-level: skills and educational qualifications

Against the background of youth's problematic labor market integration and education's 'labor market task', the question of which skills promote labor market integration, and therefore warrant most attention in educational curricula, is subject to an ongoing discussion about the emphasis on job-specific skills versus generic skills (Hanushek et al., 2011; Meng, 2006; Van der Velden, 2011a). As time within a curriculum is limited and a trade-off likely occurs in time spent on acquiring one skill at the expense of the other (e.g. Meng, 2006), both scholars and policy makers take interest in this debate and the question of which types of skills play a more positive role in graduated school-leavers' labor market integration.

Next to the type of skills acquired in education, other scholars (also) emphasize the role of educational signals (Bol & Van de Werfhorst, 2011; Levels et al., 2014; Scherer, 2005).

Employers have very little information about the actual level of job seekers' skills and therefore turn to education signals instead as a means to assess information on job-seekers' trainability, productive capacity as well as unobserved qualities, such as commitment, perseverance and motivation (Arrow, 1973; Spence, 1973). This screening process based on educational signals is a cheap method for employers to obtain more information about applications when direct information about their actual level of skills is limited.

Taken together, education provides students with different types of skills and signals, both of which are important resources for young people to enter the labor market (Hannan, Raffe, & Smyth, 1997). In Chapter 3, I contribute to this discussion by investigating the role of both (different types of) self-evaluated skills and of educational signals in school-leavers' labor market integration process, one and a half year after finishing vocational education in the Netherlands. By doing so, I build upon insights from existing research in three important ways.

First, previous research was not able to include measurements of vocational or job-specific skills, as this information is lacking in most current data (see Dieckhoff, 2008; Heisig & Solga, 2015; Protsch & Solga, 2015). In this study, I am able to take this an important step further because of the unique data I have at hand that includes measurements of both self-evaluated job-specific and generic skills of recent VET graduates. This enables me to provide new insights on the micro-level relationship between self-rated vocational skills and youth's labor market integration. Moreover, it allows me to contribute to the debate on the importance of both types of skills in the educational curriculum in upper secondary vocational education.

Second, I argue, that education does not consist of only one signal in the form of a degree, rather it conveys multiple and different types of signals (Andersen & Van de Werfhorst, 2010; Protsch & Solga, 2015). The educational signals under investigation are: having attended an apprenticeship at the firm, having attended a school-based versus work-based track, the average graduation grade, and the educational level within upper secondary VET. Aside from graduation grade, the remaining educational signals have either only been measured at the aggregated macro-level, within a specific sector or field of study, or in a vignette design (Andersen & Van de Werfhorst, 2010; Di Stasio & Van de Werfhorst, 2016; Heisig & Solga, 2015; Protsch & Solga, 2015). Moreover, this study also separately theorizes why and how each signal affects the labor market integration process. With this, I aim to provide a more detailed picture of the role of these different types of signals on young peoples' labor market outcomes, whilst taking into account the role of their self-rated level of vocational and generic skills.

Finally, while the majority of the literature investigates multiple indicators of labor market integration (Coenen et al., 2015; De Grip & Wolbers, 2006; Levels et al., 2014; Vogtenhuber,

2014; Wolbers, 2007a), these studies do not *a priori* theorize nor empirically test *whether* and *why* skills and signals have a stronger impact for one labor market outcome *compared* to the other. By tackling these questions, I aim to further unfold *whether* and *why* the role of self-rated skills and signals differs between the following indicators of labor market integration: immediate job entry after graduation, horizontal job matching (i.e. matching to the field of education), a vertical job matching (i.e. matching to the level of education), and experiencing job security (i.e. having a permanent employment contract).

1.2.2 The vocational specificity at the meso-level: educational programs

Research tends to focus on the vocational specificity of educational qualifications at the individual level and/or on the vocational specificity of educational systems at the country level (Bol & Van de Werfhorst, 2011; De Lange et al., 2014; Dieckhoff, 2008; Iannelli & Raffe, 2007; Scherer, 2005; Shavit & Müller, 2000; Wolbers, 2003, 2007a). Within this body of literature, empirical studies investigating the impact of the vocational specificity of educational programs are remarkably less prominent. To date, only a handful of studies have zoomed in on the vocational specificity at the level of educational programs (but see Verhaest, Sellami, & Van der Velden, 2017).

Whether the focus lies on the vocational specificity of education at the micro- or macro level, researchers tend to treat the vocational specificity of upper secondary education as a homogeneous entity within a country. At the micro-level, educational qualifications in upper secondary education are typically dichotomously divided into general versus vocational qualifications (Dieckhoff, 2008; Forster et al., 2016; Iannelli & Raffe, 2007; Levels et al., 2014; Scherer, 2005). At the macro-level it is quite common to investigate the vocational specificity of educational systems either dichotomously (vocational versus general, e.g. Shavit & Müller, 2000), or as the share of students enrolled in vocational upper secondary vocational education (e.g. Wolbers, 2007a). A major drawback of these approaches is that it relies on the assumption that there is no variation in the degree of vocational specificity *within* the dichotomous divide of educational qualifications or *within* educational systems that are classified as highly vocationally specific. For instance, the dichotomous divide between vocational versus general qualifications at the micro-level, heavily relies on the assumption that all 'vocational qualifications' are equally vocational specific and lead to equally high levels of specific skills. In similar vein, if a VET system (at the macro level) is classified as highly vocationally specific, all educational programs within that system are assumed to be equally vocationally specific. As a consequence, this body of research both theoretically and empirically disregards variations of the vocational specificity between educational programs in upper secondary education *within* a country. In Chapter 4, I therefore attempt to open the black box of within-country heterogeneity in the vocational impact of educational programs on youth's labor market integration in three important ways.

First, I move beyond the oversimplified divide between vocational versus general qualifications in upper secondary education often used in studies focusing on the micro-level (Dieckhoff, 2008; Iannelli & Raffe, 2007; Scherer, 2005). In line with a small but growing body of literature (Bol et al., 2019; DiPrete et al., 2017; Forster & Bol, 2018), I argue that the vocational specificity of educational programs is gradual instead of dichotomous and that there can be substantial variation in specificity between educational programs *within* VET education. This growing body of literature applies the "linkage approach", which measures the vocational specificity of educational qualifications through the observed number of occupational positions a single educational program is linked to (e.g. Bol et al., 2019; DiPrete et al., 2017; Forster & Bol, 2018; Rözer & Van de Werfhorst, 2020).

Moreover, I am able to provide a different approach compared to the linkage research that has already improved current understandings by moving beyond that dichotomous divide. Unique to this study are the two vocational measurements of educational programs, which were obtained by assessments of professionals involved in the programs (e.g. teachers, managers, educational coordinators). Through these assessments, the measurements determine the vocational specificity based on various characteristics of the (curriculum of the) educational program itself, which, to my knowledge, is a unique approach to investigate the vocational impact of educational programs.

Furthermore, in both types of the micro-level studies using either a dichotomous or gradual measurement (i.e. the linkage approach), the vocational specificity is taken into account at an individual level rather than at the level of programs. Not recognizing the hierarchical structure may have two important drawbacks. A first drawback is that it is possible that a part of these micro-effects of the vocational specificity found in previous studies are actually meso-effects in disguise. For instance, if the vocational specificity of education is only measured at the individual level, for example as having attended a work-based rather than a school-based track, the influence of characteristics of the educational program (e.g. the degree of vocational specificity) may be expressed in the track-measurement at the individual level. A second and related drawback is that – if the vocational specificity of educational programs is measured at the individual level, that is, as a characteristic of the individuals in the sample – the observations are considered independent of each other, while individuals from the same educational programs should be clustered as they share certain similarities (e.g. specificity of programs). Technically, this may lead to underestimating of the standard errors of the regression coefficient and may thereby overestimate the statistical significance of the vocational specificity of programs when measured at the individual level. As I examine the vocational specificity at the level of educational programs, I am able to prevent errors and overestimations as such. Additionally, and equally important, I am also able to disentangle the effects of one's educational attainment (i.e. educational qualification) and the vocational specificity of the programs.

Second, previous research using the linkage (or a similar) approach has encouraged future studies to better control for factors both related to school-leavers' educational decisions and their labor market outcomes, as they were only able to do so to a limited extent (see Forster & Bol, 2018, p. 189; Vogtenhuber, 2014, p. 380). I examine the vocational impact of educational programs over and above the influence of other important educational observables (e.g. educational level within VET, and average graduation grade) and individual characteristics (e.g. self-rated specific and generic skills, and parental educational background). By taking these confounding factors into account, which I have examined extensively in Chapter 3, I am able to more accurately estimate the impact of the vocational specificity of educational programs on young people's labor market integration. Whilst controlling for important educational observables and individual characteristics, I use well-established theoretical approaches, such as queuing and networks, to formulate hypotheses on the impact of the vocational specificity at the level of educational programs, the level at which these mechanisms are primarily expected to operate.

Finally, Chapter 4 provides more insight into whether the impact of the specificity of educational programs varies with regional unemployment rates within the Netherlands. In times of high aggregate youth unemployment, policy makers often mention vocational education as a solution for smoothening the transition from school to work (Di Stasio, 2017; Hoffman, 2011). Breen (2005) finds support for the argument that *systems* of vocational training which teach specific skills and incorporate a strong work-based element do provide a preventative to youth unemployment (p. 132). To date, conspicuously little is known about the extent in which the vocational impact at the level of educational programs depends on and varies with the regional unemployment rates, and may explain variation between individuals. One plausible downside of highly vocational programs might be that they limit mobility across occupations. Stronger occupational specialization in educational programs might therefore turn into a penalty when, for instance, regional unemployment rates are high and labor market demands low. Under such circumstances, school-leavers from highly specific programs may be less flexible on the labor market than their counterparts from less specific programs (Borghans & De Grip, 2000; Hanushek et al., 2017). Studies theorizing and testing this moderating role are almost completely absent, while the answer to this question may be particularly valuable for policymakers engaged in improving youth's labor market integration process.

1.2.3 The vocational specificity at the macro-level: share of students enrolled in VET

Over the past two decades, comparative research has shown that there is substantial cross-national variation in young people's transition into the labor market, and that these differences are systematically related to the way in which educational systems are organized, among which the degree of vocational specificity of educational programs (e.g.

DiPrete et al., 2017; Shavit & Müller, 1998). The consensus that has been reached in the literature indicates that the transition from school to the labor market typically runs more smoothly in highly vocational educational systems (Blommaert et al., 2020). However, the comparative literature tends to treat an educational system as if it is a homogenous entity, and therefore falsely assumes that the degree of vocational specificity at the aggregated unit of analysis, equally applies to all educational programs within that country.

In the present study, I raise and address the question to what extent the current literature has correctly estimated the vocational impact of educational systems, given that these effects may vary within systems. I argue that, without taking into account the vocational specificity of educational programs within these systems, the magnitude of the vocational impact at the country level might be overestimated in current comparative literature. It remains empirically unclear which part of these effects can be attributed to the vocational specificity of programs on one hand, and to the specificity of educational systems on the other hand. Moreover, it is quite remarkable how cross-national research has reached a consensus on the vocational impact of educational systems, but has not yet found univocal evidence for the vocational impact of programs or tracks within these educational systems (Andersen & Van de Werfhorst; Forster et al., 2016; Van de Werfhorst, 2011). There is no clear-cut evidence that highly vocational systems are particularly good for those actually enrolled in vocational programs or tracks within these systems (e.g. Blommaert et al., 2020; Iannelli & Raffe, 2007; Wolbers, 2007a). This empirical ambiguity on the meso- and macro level is not yet resolved (DiPrete et al., 2017, p. 1867).

In Chapter 5, I fill this knowledge gap by simultaneously investigating both the meso- and macro-level impact of the vocational specificity of education on young people's employment chances and hourly wages. In order to provide more nuanced insights in the within-country heterogeneity, I move beyond the dichotomous divide between vocational and general tracks commonly used (e.g. Barbieri et al., 2016; Forster et al., 2016; De Lange et al., 2014). Instead, I incorporate the "linkage approach" developed by DiPrete et al. (2017) in a cross-national design, which, to my knowledge, no cross-national study has done before. In doing so, I am able to uncover the contributions of the vocational specificity at the level of institutions and the level of educational programs on young people's employment chances and wages.

Next, looking further into (the variation in) the specificity or linkage between educational programs and occupations within countries, I aim to illuminate whether the relationship between the vocational specificity of educational programs and young people's employment chances and wages is either stronger or weaker in countries where aggregate unemployment rates are higher. To my knowledge, the present study is the first to tackle this question.

1.3 Overview of the chapters

1.3.1 Chapter 2: literature review

Over the past two decades, there has been a rapid increase in the number of studies that have examined the impact of the vocational specificity of education on school-leavers' labor market outcomes through processes at the level of individuals, educational programs, and educational systems. Although studies do sometimes take into consideration – or do touch upon the importance of taking into consideration – processes that run through other levels (e.g. Bol et al., 2019; Van de Werfhorst, 2011a), most research tends to focus on one or two of these levels. Theoretical and empirical insights in this fast-growing body of research therefore tend to be, to some extent, segmented, which may hamper building on and integrating all those different insights. What is more, focusing on one level may lead to erroneous views, as the vocational impact may differ across the different levels, and, moreover, because different mechanisms can manifest themselves at different levels. In this chapter, I provide a literature review that gives a coherent overview of the theoretical insights and empirical evidence of the vocational impact on youth's labor market integration at the three levels through which the vocational specificity of education operates. I also provide an overview of different indicators of the vocational specificity of education on all three levels prevalent in current literature.

In this review, I provided an overview of the different ways in which the vocational specificity of education can manifest itself at each level. Based on the current literature, I was able to specify which indicators (could) play a role at each level. These indicators can be empirically distinguished from one another at each of the levels, which are subsequently used in the three empirical chapters of this dissertation. At the level of individuals, there is typically a distinction between the educational qualification levels, and within those levels it is possible to distinguish between academic and general tracks (Shavit & Müller, 2000). Most often, school-leavers from upper secondary vocational education are compared with school-leavers from lower-secondary education or from upper secondary general education (see Iannelli & Raffe, 2007, p. 50). A second indicator is the type of skills acquired in education, which is related to the distinction between vocational versus general educational qualification levels. Human capital theories suggest that vocational upper secondary education, by providing vocational skills required in the workplace rather than more generic skills, may enhance the human capital of young people and, subsequently, improve their earnings and employment chances (Becker, 1964). Third, there is also heterogeneity within vocational upper secondary education: in some countries, students can either follow school-based in which learning mostly takes place at school, or work-based tracks in which most of the learning takes part at the workplace.

The vocational specificity of educational programs typically reflects the vocational specificity of the curricular design and content of educational programs and the extent to which educational programs are institutionally linked to employers or organizations in the labor market (Allmendinger, 1989; Müller & Gangl, 2003; Rosenbaum, Kariya, Settersten, & Maier, 1990; Shavit & Müller, 1998, 2000; Wolbers, 2007a). Moreover, the vocational specificity of educational programs can have an influence on young people's labor market chances, independent of the influence of individual characteristics, such as (vocational and generic) skills, average graduation grade, educational attainment, apprenticeship experience, and type of attended track. Research typically argues that school-leavers from more vocationally specific programs have (and/or signal to have) obtained highly specific skills and are therefore more immediately productive on the job, and thus more in demand by employers (Arum & Shavit, 1995; Scherer, 2005; Van de Werfhorst, 2011a; Wolbers, 2007a). Moreover highly vocational programs may signal to employers that school-leavers from those programs require less on-the-job training than those from less specific programs (Glebbeek, 1998; Van der Velden & Wolbers, 2007).

Third, the vocational specificity of education at the institutional level is regarded as an important institutional feature that explains cross-national differences in the school-to-work transitions of young people. There is no generally accepted definition of the vocational specificity of educational systems; it has is typically been described as the extent to which educational programs within a country prepare students for specific occupations and provide them with job-relevant skills that are in demand by employers (Allmendinger, 1989; Blossfeld, 1992; Shavit & Müller, 1998), but also as the degree to which institutional linkages exist between education and the labor market (Allmendinger, 1989; Blommaert et al., 2020; Raffe, 2008, 2014). Earlier research used typologies to capture differences between institutional settings. For example, the concepts 'qualificational spaces' and 'organizational spaces', or 'internal labor markets' and 'occupational labor markets' are used to distinguish between having systems a strong vocational orientation and those that are characterized by a lack of clear vocational orientation (e.g. Marsden, 1999, Gangl, 2001; Maurice, Sellier & Silvestre, 1986; Raffe, 2008, 2014). More recent studies have defined the vocational specificity of systems as the share of student in upper secondary education enrolled in vocational tracks (e.g. Bol & Van de Werfhorst, 2011; Breen, 2005; Van de Werfhorst, 2011a; Wolbers, 2007a).

Altogether, this has resulted in an overview of common indicators that capture the vocational specificity of education at each level. In the subsequent chapters, I implemented these indicators and theoretically and – where possible – empirically took into account that the vocational specificity of education is embedded within systems, within programs, and ultimately within school-leavers who are exposed to and influenced by these contexts.

1.3.2 Chapter 3: individual level

In the first empirical chapter, I zoom in on the influence of the vocational specificity of education on the individual level. Specifically, I investigate to what extent self-rated specific and generic skills and different types of educational signals are positively related to immediate job entry, horizontal matching, vertical matching, and job security among recently graduated VET school-leavers in the Netherlands. Moreover, I provide new insights by tackling the questions whether and why the role of self-rated skills and signals differs between various indicators of labor market integration. Based on human capital theory, I hypothesize that school-leavers' self-rated specific skills are more positively related to the labor market outcomes under investigation than self-rated generic skills. Next, regarding educational signals, I hypothesize that having a pre-existing relationship with a firm, having attended a work-based track, having attended a higher educational level within VET, and having a higher average graduation grade all increase school-leavers' labor market chances. Lastly, I formulate hypotheses on how educational signals are more positively related to immediate job entry compared to the other labor outcomes, whereas with respect to self-rated specific skills, I expect a stronger positive relationship with horizontal and vertical job matching and job security compared to immediate job entry.

To test my hypotheses, I use data from the upper secondary VET survey ('BVE monitor' in Dutch) collected in the Netherlands in 2015. The survey collects information among school-leavers that have graduated one and a half years ago. I conducted binomial logistic models on the final analytical sample consisting of 6,014 school-leavers. The findings show that school-leavers' self-rated specific skills – acquired either in education or on-the-job – are more positively related to the investigated labor market outcomes than self-rated generic skills in the first eighteen months of school-leavers' integration process. Next, I find that school-leavers' self-rated skills and (most of the) educational signals have an independent positive relation with the labor market outcomes under investigation. Both apprenticeship training and completing a work-based track increase chances of immediate entry, horizontal matching, and job security. I attribute these findings to clearer signals of on-the-job experience and productivity. What is more, the positive impact of apprenticeship training indicated that network mechanisms and screening mechanisms are at work: employers are able to pre-screen the student and assess their trainability, which seems to provide vocational school-leavers a foot in the door at the firm. Next, school-leavers from higher educational levels within VET have increased labor market chances on all investigated outcomes. This finding can be attributed to screening mechanisms; those with a lower educational attainment are typically placed in a lower rank in the job queue. Higher average graduation grades only increase school-leavers chances of job matching, which indicates that grades play a decisive role when job applications with similar qualifications apply for the same job. Finally, with respect to the question whether (and why) self-rated specific skills and signals vary between the labor market outcomes under investigation, I found mixed results. One unambiguous conclusion that I can nonetheless

draw from the findings, is that apprenticeship training and a work-based track are more important for graduates' chances to experience immediate job entry and permanent employment compared to horizontal and vertical matching, which I attribute to stronger network mechanisms and clearer signals of on-the-job experience.

1.3.3 Chapter 4: meso level

The present study attempts to open the black box of the within-country heterogeneity of the 'vocational impact' of educational programs, by investigating the extent to which the vocational specificity of educational programs has an impact on having a paid job and experiencing immediate job entry and job matching among recently graduated VET school-leavers in the Netherlands. I formulate hypotheses on how the vocational specificity of educational programs increases school-leavers' labor market chances through signaling processes (Arrow, 1973; Spence, 1973; Thurow, 1975) and network mechanisms (e.g. Rosenbaum et al., 1990). In addition, this study sheds light on the moderating role of regional youth unemployment rates on this relationship.

I employ data from the VET survey ('BVE monitor' in Dutch) enriched with, firstly, the VET expert survey ('CGO monitor' in Dutch) which includes the vocational measurements, and secondly, contextual-level data from Statistics Netherlands. The vocational specificity of educational programs is measured in terms of: (1) the amount of vocational skills and knowledge provided in the program, and (2) the amount of apprenticeship training (i.e. on-the-job experience). The final analytical sample covers 15,571 school-leavers from 114 different educational programs between 2010 and 2014. The findings from the logistic multilevel models show that there is indeed variation in the vocational specificity between the educational programs within VET. The vocational specificity of educational programs in terms of the amount of apprenticeship training during the program improves school-leavers chances in terms of all labor market outcomes under investigation. Additional descriptive findings demonstrate that 47 percent of the school-leavers had a pre-existing relationship with the firm at their current job, which indicates that employers favor these school-leavers, and that workplace training does operate as a 'foot in the door' for recent graduates. However, the vocational specificity in terms of the extent to which vocational knowledge and skills provided in the program only increases school-leavers' chances of immediate job entry and of having a horizontally matching job. This indicates that more vocationally specific educational programs – especially those with a stronger emphasis on apprenticeship training – increase VET school-leavers' labor market opportunities in the Netherlands. This may be explained by the increased contact between students and employers or the (subsequently) increased signaling power of these programs to employers. With respect to the moderating role of aggregate regional youth unemployment rate, I find no evidence that the vocational impact of educational programs varies with regional economic conditions. In other words, school-leavers from

highly vocational programs are not less flexible on the labor market in regions where regional economic conditions are worse. Altogether, by moving beyond the dichotomous divide between vocational versus general qualifications, I have provided more nuanced insights in the within-country heterogeneity of the vocational impact of educational programs, which, in general, seems to increase young people's labor market opportunities in the Netherlands.

1.3.4 Chapter 5: macro level

In this country-comparative study, I raise and address the question to what extent the literature has correctly estimated the vocational impact of educational systems, given that these effects may vary within systems. I argue that, without taking into account the vocational specificity of educational programs within these systems, the magnitude of the vocational impact at the country level might be overestimated in current literature. This study addresses this knowledge gap by simultaneously investigating both the meso- and macro-level impact of the vocational specificity of education on young people's employment chances and hourly wages. In addition, I provide novel insights into whether vocational impact of educational programs varies with aggregate unemployment rates of countries.

I use data from the Programme for the International Assessment of Adult Competencies (PIAAC) from 2012 and 2015. To measure the vocational specificity of educational programs, I use the linkage approach which I calculate on data from the Labor Force Survey. The final calculation of the linkage approach was later added and matched to the PIAAC data. Next, I enriched the PIAAC data with contextual-level data from OECD, UNESCO, and ILOSTAT. For instance, the vocational specificity of educational systems is measured with the percentage of students enrolled in upper secondary vocational programs; information which was collected by the OECD. Results from the three-level multilevel models show that the vocational specificity of educational programs is important in explaining young people's employment chances, while the aggregate vocational specificity of educational systems has no evident impact. Moreover, the positive vocational impact of programs is weaker in countries where unemployment rates are higher. This suggests that the relative advantage that young people from more specific programs have, compared to those from less specific programs, is smaller in countries with higher unemployment rates. Young people's gross hourly wages remain unaffected by the vocational specificity of educational programs as well as educational systems. All in all, this study is the first to present evidence that, by not taking into account the within-country heterogeneity of the vocational specificity of programs, country-comparative research has overestimated the vocational specificity of educational systems on young people's employment chances.

1.4 General conclusion and discussion

According to the school-to-work literature, the impact of the vocational specificity of education runs through processes at the level of educational systems, educational programs, and individual school-leavers (e.g. Blommaert et al., 2020; DiPrete et al., 2017; Raffe, 2008, 2014). Despite this established knowledge, prior research has typically focused on one, or a subset of these levels. This can lead to fragmented information and may even lead to erroneous conclusions, because different mechanisms may manifest themselves at different levels and lead to different vocational effects across these levels. The central aim of my dissertation is therefore to examine the influence of the vocational specificity of education on the micro, meso and macro level, in order to provide more structured and nuanced insights in how young people's labor market outcomes relate to the vocational specificity of education on these levels. In the first study, I conducted a literature review to provide an overview of existing insights of the vocational impact at each level and a system of indicators prevalent in current literature of the vocational specificity of education on the micro-, meso-, and macro-level. This is followed by three empirical chapters, in which I have obtained knowledge pertaining to the vocational impact of education at each level.

Overall, the findings of the three empirical chapters point to a smoother school-to-work transition among upper secondary school-leavers from more vocationally specific programs compared their counterparts from more general programs. While this seems to align with the general notion in current literature that vocational education smoothens the transition from school to work, my findings show that the vocational impact is not as straightforward as suggested by this statement. Here, I will discuss important nuances that have emerged from the findings of this dissertation. First, the findings in Chapter 3 and 4 show that the vocational impact measured at either the level of individuals or educational programs varies across the different labor market outcomes under investigation. The influence of having highly vocational skills (micro-level), the impact of having attended a work-based track by school-leavers (micro-level), and the impact of the vocational specificity of educational programs (meso-level) all point towards increased labor market chances in terms of immediate job entry after graduation and having a paid job. However, the results are rather mixed and thus less straightforward with regards to horizontal and vertical job matching and experiencing job security (i.e. having a permanent contract). Thus, highly vocationally trained school-heavers have better chances of entering the labor market immediately after graduating and have better chances of finding paid employment than their more generally trained counterparts, but this vocational advantage does not necessarily (always) hold with regards to increases chances of finding a matching job or experiencing job security.

Second, the findings from all empirical chapters particularly point out the importance of (the amount of) apprenticeship training at the firm. The positive effects of (1) having a pre-existing relationship with a firm during education, (2) having attended a work-based rather

than a school-based track, and (3) the vocational impact of the amount of apprenticeship training in educational programs, indicate that signals of on-the-job experience and network mechanisms are at work, and that workplace training does operate as a 'foot in the door' for recent school-leavers. More importantly, these findings suggest that it is not the vocational specificity of educational programs in terms of occupation-specific skills and knowledge that drive these results, but rather the close involvement of employers and firms in the educational program, which next to establishing a network, also increases the signaling power of educational qualifications and employers' confidence to rely on the information that these signals convey about students' level of job-specific skills, their trainability and potential productivity (Bol & Van de Werfhorst, 2011; Breen, 2005; Iannelli & Raffe, 2007; Levels et al., 2014, Scherer, 2005).

Third, the cross-national study in Chapter 5 is the first to present evidence that the country comparative school-to-work research has overestimated the vocational specificity of educational systems on young people's employment chances by not taking into account the variation in the vocational specificity between educational programs *within* a country. In fact, the role of vocational specificity in school-to-work transitions is predominantly present at the level of educational programs rather than at the level of educational systems. This shows the importance of taking into account the multiple levels at which the vocational specificity of education manifests itself. Not only does it provide insights into what happens at what level, the vocational specificity of education may play a different role across the three levels on youth's labor market outcomes. A promising direction for future research is thus to simultaneously investigate – or at least take into consideration and apply nuances to – the contributions of the vocational specificity of education at each of the levels. For example, for future country comparative research it is of crucial importance to take into account the within-country heterogeneity of the specificity of educational programs, in order to prevent overestimations or incorrect estimations.

Fourth, I have looked into the extent to which the vocational impact of educational programs may vary across aggregate regional unemployment conditions (Chapter 4) and macro-economic conditions (Chapter 5). I found that young people from more specific educational programs have better employment chances when macro-economic conditions are good, but the relative advantage they have compared to their counterparts from less specific programs is smaller in countries with poorer macro-economic conditions (Coenen et al., 2015; Korpi et al., 2003). Having attended more vocationally specific programs does, however, not turn into a penalty in countries where aggregate unemployment levels are high. Furthermore, and in contrast, when investigating this relationship among school-leavers from upper secondary education (i.e. ISCED 3) only, the vocational impact of programs does not vary with macro-economic conditions of countries. Chapter 4 shows similar findings among upper secondary vocational graduates within the Dutch context. These contrasting conclusions allude that this may have to do with the educational groups that are being compared. A tentative explanation might be that, if looking at upper

secondary graduates only, the comparison between specific-generic programs is largely omitted, and, as it turns out, economic downturns hit school-leavers *within* this group equally hard, irrespective of how vocationally specific their educational program was.

Although this dissertation provides valuable knowledge on how the vocational specificity of education at the three levels affect young people's labor market integration, there are still challenges and questions open for future research. First, I made the choice to only focus on school-leavers that are no longer in education. Young people's decision to continue education may be based on experiencing or expecting difficulties in attempting to transition to the labor market. This means that my conclusions are limited to the subgroup of school-leavers who do decide to attempt to enter the labor market. However, this was a necessary selection in order to investigate how and why school-to-work transitions differ between school-leavers.

Second, it might have been interesting to (also) look beyond the immediate transition from education to work as the vocational impact of education might vary over the life-course (Forster & Bol, 2018). Recent studies claim that the advantages of more vocationally specific programs might decline over the life course (Forster & Bol, 2018; Forster et al., 2016; Hampf & Woessman, 2017; Hanushek et al., 2017; Rözer & Bol, 2019). While some studies found that the impact of skills on earnings declined over the life course (e.g. Hanushek et al., 2017), others did not find this "vocational penalty" later in the career (e.g. Forster & Bol, 2018). The main argument is that over the course of one's career, task demands in occupations change, and the occupation-specific skills that are acquired in education become obsolete. Individuals from more general educational programs have a broader or more general set of skills and are therefore better able to adapt to changing skill demands caused by technological innovations. Notwithstanding the importance of this life-course perspective, the focus in this dissertation is set on the *transition* from education to work among recent school-leavers; it investigates whether the crucial phase of transitioning from education to the labor market runs more smoothly when education is more vocationally specific.

Third, a very common limitation in this body of research is the possibility for mechanism testing. The vocational specificity of education runs through processes at the level of educational systems, educational programs, and individual school-leavers, that often cannot be disentangled or fully exposed using cross-sectional, large-scale questionnaire data. This can pose a limitation because a larger number of assumptions have to be made in order to formulate an hypothesis. Experimental studies are therefore required to test more of the mechanisms (i.e. human capital, signaling, and network mechanisms) that I propose in this dissertation. In-depth qualitative studies with or a vignette design among employers can also be a fruitful avenue to test theoretical arguments and gain more insight into employers' hiring behavior. To name a few, it can provide insights into how employers receive and respond to different types of signals and why, what types of

skills and prior experiences they find relevant and look for in new entrants, and to what extent they rely on information from their network. All in all, more research is needed to disentangle and further unpack which underlying mechanisms and processes drive the vocational impact.

Throughout this dissertation, I have emphasized that the role of the vocational specificity of education should be investigated while taking into account or, if not possible, embed it within the (institutional) context of the vocational specificity at the other level(s). What insights are provided by taking this into account? Starting off with the most straightforward conclusion, which is that integration into the labor market is smoother among upper secondary school-leavers from more specific programs than those from more general programs. An obvious yet often overlooked nuance is that "the vocational impact" is not equally beneficial for *all* labor market outcomes (see also Blommaert et al., 2020, p. 735). The main take away from this dissertation is that, by investigating each subsequent level and taking these levels into account, the role of vocational specificity in school-to-work transitions is most predominantly present at the level of educational programs. Focusing on one level may even lead to incomplete and erroneous insights. In relation to this, I showed that there is variation in the vocational specificity of education within countries, and even within upper secondary education, which indicates the importance of *not* dichotomizing educational qualifications (micro-level) or educational programs (meso-level) into vocational versus general categories, as well as not treating the vocational specificity of education at the aggregated unit of analysis as if it is a homogenous entity, without taking into account the specificity of educational programs that can vary considerably within national education systems.

1.5 Policy Implications

Besides making important contributions to the academic field studying school-to-work transitions, this dissertation also provides insights relevant for policy makers who aim to improve this transition among recent school-leavers. Changes in the world of work, such as technological change, globalization and flexibilization (Allen & Van der Velden, 2012; Levy, 2010), have sparked debates on how the vocational specificity of education is best organized for the labor markets of tomorrow, particularly because vocational skills that are acquired in education are argued to be at risk of becoming obsolete (Hanushek et al., 2017). At the same time, the role of vocationally specific education still seems to live up to its expectations in facilitating school-leavers' integration into the labor market (e.g. Barbieri et al., 2016; Bol et al., 2019; De Lange et al., 2014; Forster et al., 2016; Forster & Bol, 2018). Should education put more emphasis on a more occupationally-specific or a more generic curriculum?

Altogether, my findings indicate that highly vocational programs smoothen school-leavers' entry into the labor market immediately after graduating, and increase their chances of finding paid employment over and above the influence of: (1) various types of skills and educational signals at the individual level, and (2) various macro-characteristics of the educational- and labor market system (i.e. the degree of the vocational specificity, and external differentiation of the educational system, the degree of employment protection legislation of a country). In addition, the role of the vocational specificity of education at the individual level particularly points towards the importance of having a pre-existing relationship with a firm or having attended a work-based track.

Embedding these findings within the theoretical framework, they indicate that stronger signaling (of job-specific skills and on-the-job experience) and network mechanisms can increase school-leavers' labor market opportunities in well-developed occupational labor markets, such as the Netherlands. These processes seem to work through the close involvement of employers and firms in the educational program, the amount of apprenticeship training in the program and the extent to which the educational program is linked to occupational positions. Moreover, it suggests that the emphasis that is put on vocational versus generic skills in this debate should shift towards the role of the institutional linkage between education and the labor market, and the close involvement of employers in educational curricula.

This brings me back to the question on how vocational education can best be organized for the labor markets of tomorrow. The positive evaluation of the role of vocational specificity in smoothening the transitions from education to work may prompt calls for a stronger vocational specificity in education and a closer involvement of employers and firms in educational programs.

CHAPTER 2

Literature review:

What happens at the micro, meso and macro level?*

* A slightly different version of this chapter has been published as:

Muja, A., Gesthuizen, M., & Wolbers, M. H. J. (2021). Vocational education and youth labor market integration: The role of vocational specificity at the level of school-leavers, study programmes and educational systems, In: Marshall, E. A., & Symonds, J. E. (eds.). *Young Adult Development at the School-to-Work Transition: International Pathways and Processes*. Oxford: Oxford University Press.

In addition, a Dutch version and also slightly different version of this chapter has been published in 'Tijdschrift voor Arbeidsvraagstukken' in 2020 (volume 36, issue 4).

2.1 Introduction

The transition from school to work is an important rite of passage in young people's lives, in which educational qualifications have a profound impact on young people's integration into the labor market. It refers to the period between the end of young people's enrolment in school based education and their first job position in the labor market. Youth's initial labor market entry after leaving school is one of the crucial changes young people experience in emerging adulthood (Arnett, 2000; Bynner, 2005). The transition from school to work is regarded as a decisive stage in the process of becoming an adult and is closely related with other transitions in youth, such as leaving the parental home and starting a family (Wolbers, 2007b). The impact of this transition goes beyond the initial labor market position, given the substantial empirical evidence that the first steps taken in the labor market determine subsequent employment chances, labor market outcomes and life chances (Barone & Schizzerotto, 2011; Scherer, 2005; Wolbers, 2007b). This is especially true for young people from upper vocational education compared to their counterparts from higher education, as they experience the final stage of occupational identity formation within the period of emerging adulthood (Bynner, 2005). Hence, a smooth transition from school to work is not only crucial during young people's early labor market career during emerging adulthood, as it prevents unemployment or inactivity when leaving school, but also in terms of long-term effects on their future careers and overall future life prospects.

With regard to the significant impact of education on labor market integration and outcomes, one of the key functions of education is to prepare young people for the labor market (Van de Werfhorst, 2014). However, in many Western societies, including the Netherlands, social scientists and policy makers are concerned about the difficulties young people face when entering the labor market. Previous comparative research has found that the share of unemployment and temporary employment is high among youth in Europe (De Lange et al., 2014; Scherer, 2005). These concerns are even greater for school-leavers with lower educational qualifications, as they have higher risks of unemployment or, if employed, have higher risks of attaining less stable, less autonomous, lower-skilled, and lower-paid jobs (De Grip & Wolbers, 2006).

The vocational specificity of the educational system is regarded as a central component for allocating young people to the labor market (Van de Werfhorst, 2014), helping school-leavers to avoid risks of unemployment, and becoming skilled rather than unskilled workers (Arum & Shavit, 1995). Most upper secondary educational systems distinguish a vocationally and academically oriented track. The vocational specificity in upper secondary education is the extent to which vocational-specific skills are emphasized as opposed to more academic skills. Different existing theoretical frameworks yield contrasting notions about the impact of vocational skills on labor market returns. Two dominant theories in the current literature are human capital theory (Becker, 1964) and job competition theory (Spence, 1973; Thurow, 1975). According to human capital theory, investment in vocational

education equips students with relevant job-specific skills that make them immediately productive in the labor market as opposed to investment in academic education. Human capital theory holds the assumption that employers act rationally and prefer employees with higher levels of labor productivity. On the other hand, job competition theory predicts that vocational school-leavers are stigmatized by employers as being less motivated or having less (cognitive) abilities than academic school-leavers (Iannelli & Raffe, 2007). This presumed negative signal of vocational qualifications might place vocationally educated school-leavers lower in the job queue, resulting in risks of unemployment and a troublesome transition from school to work.

To examine the role of vocational education during the transition from school to work, it is important to adequately define the various aspects of both vocational specificity and youth labor market integration. In the existing literature, the latter often refers to various labor market outcomes of young people: risks of unemployment, instability of employment (i.e. fixed-term or temporary employment; De Lange et al., 2014; Gebel & Giesecke, 2016), the duration of job search (Wolbers, 2007a), and the quality of the (first) job (e.g. occupational status and wage level) (Müller, 2005; Wolbers, 2007a).

In this chapter, we discuss the role of vocational specificity in upper secondary education in promoting (or not) youth labor market integration. The first reason why this is an important issue to consider is that social inequality manifests itself within a society through young people's labor market opportunities, which are, at least partly, shaped by the way institutional arrangements of an educational system are organized (Shavit & Müller, 1998). Second, even though the impact of vocational specificity runs through at least three levels – that is, individual vocational-specific skills, the vocational specificity of educational programs, and the vocational specificity of national educational systems – research on the impact of vocational education on youth labor market integration usually focuses at a subset of these levels. To establish more clarity in the overall impact of vocational education, we argue that an overview of the theoretical insights and empirical evidence regarding this field of research is necessary, paying special attention to the levels through which the impact of vocational education might operate. This should lead then to the development of a structured set of indicators that measure the vocational specificity of education on all three levels, integrating relevant social-scientific knowledge from different disciplines.

2.2 Vocational specificity of education at different levels

As we have indicated, the vocational specificity of education manifests itself at three levels: individuals (or school-leavers), educational programs and educational systems. A country's structure of the educational system affects the design of the educational programs within that country, and this consequently has an influence on the type of

knowledge, skills, and competencies that are obtained by the individuals participating in that particular educational program within that particular educational system. In addition, as education plays a large role in the socialization of students, it is at least plausible that school-leavers' values, preferences and goals are influenced by the educational system and educational program attended. In the search for a job, school-leavers' choices of action on the one hand depend on educational requirements (e.g. vocational or academic qualifications), individual preferences and resources. On the other hand, the institutional context restricts and pre-defines school-leavers' resources and opportunities, influencing their search for a job and their labor market integration.

On the level of individual school-leavers, vocational specificity reflects the distinction in their acquisition of either generic or specific competences (Meng, 2006). Generic competences refer to general or academic knowledge and skills that can be applied in a wide variety of contexts, whereas specific competences refer to vocational or job-specific knowledge and skills that can be applied in a limited number of occupation-specific contexts (Van der Velden, 2011b). In general, it is assumed that school-leavers from vocationally oriented educational programs are equipped with job-specific knowledge and skills, making them immediately productive on the job compared to their counterparts from more generally or academically oriented education (Bishop, 1995; Shavit & Müller, 2000). This immediate labor productivity is what makes vocationally-trained school-leavers valuable and more in demand by employers, which may in turn also enhance their employment opportunities (Hanushek et al., 2011).

On the level of educational programs within a country, vocational specificity usually refers to the relative degree to which educational programs equip their students with job-specific knowledge and skills required to practice a particular occupation or profession. As such, and independent of the individual skills of school-leavers, programs emit signals to employers regarding the potentiality of the students that completed them. Previous research has argued that school-leavers from more vocationally oriented educational programs are more in demand by employers, because they require less on-the job training than school-leavers from generally or academically oriented educational programs (Glebbeek, 1988; Van der Velden & Wolbers, 2007).

On the level of national educational systems, vocational specificity reflects the institutional linkage between education and the labor market (Allmendinger, 1989; Shavit & Müller, 2000). The strength of the institutional linkage depends on the degree to which the labor market system in a country is involved in the design and the administration of the educational system (Shavit & Müller, 2000). There are various ways in which this institutional linkage can be organized, which basically refers to the extent to which theoretical learning is combined with practical work experience. In general, vocationally oriented educational systems are considered to be strongly linked to the labor market, whereas generally oriented educational systems are considered to be weakly associated

to the labor market (Wolbers, 2003, 2007b). Figure 2.1 illustrates the manifestation of the vocational specificity of education on all three levels in relation to youth labor market integration.

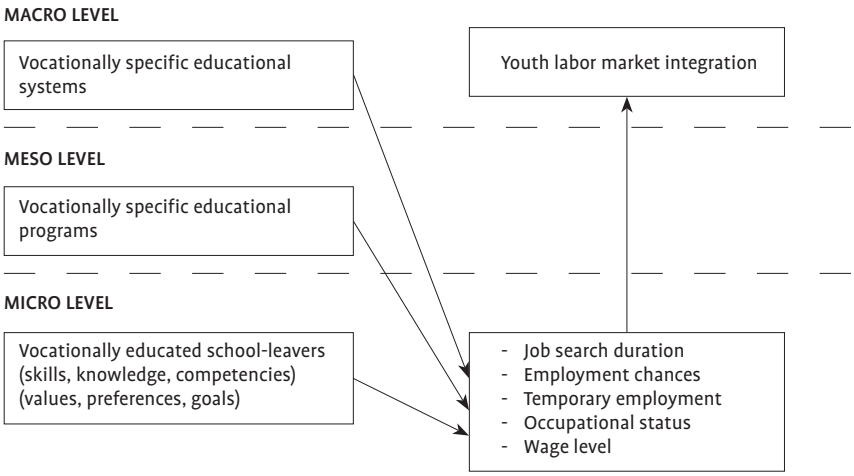

Figure 2.1 | Schematic overview of the role of vocational specificity on youth labor market integration.

2.3 The role of vocational specificity at the level of school-leavers

Various individual mechanisms are at play in how education impacts youth labor market integration. This section gives an overview of some of these mechanisms to offer an insight into why education provides different labor market returns between school-leavers.

2.3.1 Level of education

According to human capital theory (Becker, 1964), the acquisition of knowledge and skills through schooling is a form of capital. Individual expenditures on human resources, such as education, can be seen as the product of deliberate self-investment (Schultz, 1961). By investing in education, people acquire more skills, knowledge and competencies that directly affect their labor productivity, valued and rewarded by employers, which improves their prospects in the labor market, including an increase in employment opportunities (Bishop, 1995; Borghans & Heijke, 2005; Schultz, 1961). Over the years, studies have continually found that more educated people have better employment opportunities, higher occupational status, higher salaries, and better employment contracts than less educated people (e.g. Andersen & Van de Werfhorst, 2010). Thus, increasing educational input typically leads to higher labor market outputs through the acquisition of skills, knowledge and competencies (Hanushek & Woessmann, 2005).

However, level of education is just one piece of the big puzzle in how education promotes youth labor market integration. Large differences in labor market integration are found even between school-leavers with the same level of education (Iannelli & Raffe, 2007, Levels et al., 2014; Pfeffer, 2015; Shavit & Müller, 2000). These findings indicate that horizontal differentiation in education matters as well and is related to the type of education attained, specifically vocational versus general education, and the way its organization prepares school-leavers for the labor market (Pfeffer, 2008).

2.3.2 Vocational versus general skills

The distinction between vocationally and generally oriented education received much attention in the literature and this form of horizontal differentiation has led to an ongoing debate as to whether vocational or general skills are more effective in facilitating youth's employment opportunities, and their school-to-work transition. General or academic education provides students with generic or academic skills, which can be defined as cognitive, analytical, communicative, and problem-solving skills that can be applied in a wide range of contexts (Heijke, Meng, & Ris, 2003; Meng, 2006). Thus, generic skills are occupation-independent and are transferable to other occupational contexts. General education often prepares students for higher levels of education. In contrast, vocational education refers to the extent to which students are provided with work-specific skills, which can be defined as job-specific knowledge directly applicable in the labor market. These skills can only be applied in a limited number of occupation-specific contexts (Van der Velden, 2011b).

Within the framework of human capital theory – with its focus on skills of productive value in the labor market – an important question is what type of skills should be learned at school that bring forth productive workers in the workplace? A central assumption is that school-leavers from vocational education programs are equipped with job-specific skills that make them immediately productive on the job as opposed to their counterparts from general education (Bishop, 1995; Shavit & Müller, 2000). Because of their immediate job productivity, vocationally trained school-leavers are more valuable and in demand from employers, which enhances their chances of entering the labor market successfully (Hanushek et al., 2011).

Contrariwise, job competition theory (Thurow, 1975) gives little weight to teaching vocational skills in schools. This theory assumes that labor productivity is determined by occupational characteristics rather than individual ones. It also assumes that vocational skills are mainly acquired through on-the-job training and not in education. Education does not really provide students with productive skills, but instead provides general cognitive skills that are seen as important signals of school-leavers' learning abilities, motivation and perseverance in obtaining new job-relevant skills (Van der Velden & Wolbers, 2007). In this perspective, education serves as a 'screening device' or 'signal'

to future employers (Spence, 1973). Job seekers with more education signal higher levels of productivity (Bol & Van de Werfhorst, 2011). Employers use educational degrees or credentials to screen job applicants and put them in an imaginary labor queue (Thurow, 1975).

Related to this theory is the notion that educational degrees can be expressed as credentials that act as a mechanism for education as a means of social closure by the elites, where people are not selected for their productivity per se, but for the external standards of what they possess (Collins, 1979). In this perspective, diplomas, degrees, and certificates are replaced by a more loaded concept of credentials, set up to create legitimate social barriers that sustain social differences and structure the access to occupations (Bol & Van de Werfhorst, 2011). Credentials give access to higher-status occupations and the higher the educational credentials, the more access to higher-status occupations school-leavers have. Following both signaling and credentialing mechanisms, degrees are not only rewarded because they signal the potential productivity of a job applicant, but also because access to occupations is regulated on account of credentials (Bills & Wacker, 2003).

Furthermore, the labor queue model yields negative predictions for the effect of vocational education on the labor market integration of school-leavers. Vocational education is often attended by academically weaker students and can inhibit further educational attainment (Shavit & Müller, 2000). As vocational students have fewer opportunities to enter higher education than academic students and tend to have earlier exits from school (Ryan, 2000), vocationally trained applicants may be stigmatized as being less motivated or having less (cognitive) abilities than academically trained applicants (Iannelli & Raffe, 2007; Spence, 1973). This stigmatization might place vocational school-leavers lower in the labor queue, resulting in (higher) risks of unemployment and a troublesome transition from school to work.

However, empirical studies have found that vocational education actually reduces unemployment risks compared to general education, which refutes the idea that vocational degrees serve as negative signals to employers (Bol & Van de Werfhorst, 2011; Breen, 2005; De Lange et al., 2014; Müller, 2005). In terms of signaling, it may be the case that vocational credentials send employers stronger and clearer signals of school-leavers' productivity and abilities than general qualifications. Whether vocational credentials indeed act as positive or negative signals and whether these signals are strong and clear for employers, most likely depends on the organization of educational programs and institutional characteristics of educational systems (Meng, 2006; Müller, 2005; Scherer, 2005). We will elaborate on this in more detail in the following sections.

To date, empirical research on school-to-work transitions deals with a crucial limitation in examining the impact of vocational (versus general) skills, that is, a lack of high-quality

and cross-national comparable direct measures of the actual obtained vocational skills of school-leavers. In the majority of studies an indirect approach is therefore applied, in which an educational qualification in upper secondary vocational education is seen as a suitable measure of the extent to which vocational skills are acquired (e.g. De Lange et al, 2014; Heisig & Solga, 2015; Iannelli & Raffe, 2007; Levels et al., 2014; Scherer, 2005; Wolbers, 2007a). One reason for this is that vocational skills are acquired in and therefore mainly associated with upper secondary vocational education in many countries. Nevertheless, this type of qualification is a relatively crude measure of the actual vocational skills taught in these programs (Bol & Van de Werfhorst, 2013). Even within a vocational track, the degree of vocational specificity might vary between programs. Progress in this field of research can be made by developing a more direct measure of vocational skills.

2.3.3 Apprenticeship training

Vocational education can be organized in various ways, whether this is entirely school-based or offered through a combination of school-based teaching and learning at the workplace, such as apprenticeships at firms. In this latter dual system, employers have an influence on the curriculum, which increases the likelihood that the acquired skills are in demand by employers (Ryan, 2001). In addition, apprenticeships are more standardized than firm-specific on-the-job training, and, therefore, the acquired skills are better transferable across employers, firms or industries (De Grip & Wolbers, 2006). Apprenticeships offer advantages in the allocation process for both employers and school-leavers. For employers, school-leavers with apprenticeship experience are very attractive, since they have already acquired the skills required for the jobs, which saves firms additional training costs. Moreover, employers have the opportunity to screen potential workers during their apprenticeship, which also decreases selection and allocation costs. As for students, apprenticeships provide not only work experience within a firm but also allow students to become acquainted with the firm and its employees. From a network perspective, apprentices benefit from the social capital acquired at the workplace, which gives them easier or even immediate access to employers or their networks that recruit employees (Rosenbaum et al., 1990). Furthermore, successful completion of an apprenticeship may increase the likelihood of staying employed within the same firm. Accordingly, research has found that apprenticeships are indeed effective in facilitating youth labor market integration (Lerman, 2009; Müller, 2005), in that school-leavers who obtained a vocational degree by combining learning and working in the dual system have lower unemployment risks than their counterparts from school-based vocational education.

2.3.4 Field of study

Horizontal differentiation is a key mechanism in most educational systems. This refers to the extent to which students are adequately sorted in educational programs of different fields of study that matches their personal talents and interests. Choosing a field of

study has a major impact on further direction and future prospects in the labor market. In this subsection, we discuss the varying skills acquisition between fields of study that can impact youth labor market integration, whereas in the next section we focus on the relationship between educational programs of different fields of study and the labor market integration of school-leavers.

Human capital theory brings forth a straightforward explanation of why different fields of study carry different labor market outcomes. Proponents of this theory assume that different fields of study represent different types of specialized human capital (Daymont & Andrisani, 1984; Paglin & Rufolo, 1990; Reimer, Noelke, & Kucel, 2008). Students invest in a specific field of study to accumulate skills and knowledge that increase labor productivity rewarded by employers. It seems plausible that different fields of study vary in their content provision for vocational knowledge and skills and that certain fields offer opportunities for students to develop more productive skills and thus better prepare students for the labor market than other fields of study (Van de Werfhorst & Kraaykamp, 2001).

Regarding specific fields of study, scholars have developed a comprehensive framework within the human capital approach, relating fields of study to four different types of skills: cultural, economic, communicative, and technical skills, versus general skills (Kalmijn & Van der Lippe, 1997; Van de Werfhorst, 2002). For example, technical fields may require more vocational knowledge and skills for students to be sufficiently prepared for the labor market as opposed to cultural fields (Dronkers, 1993). Moreover, the labor market returns to different fields may also depend on the scarcity of the type of specific human capital they are associated with (Paglin & Rufolo, 1990). For example, if fields of study are associated with a scarce form of specific human capital that is in high demand in the labor market, such as computer programming skills, then this may have higher rewards for individuals in the labor market. As most empirical research on fields of study has not measured the actual acquisition of a certain group of skills, it would be interesting for future research to take this into account as well.

From a signaling perspective, some fields of study may be more challenging for students than others and require higher levels of prior ability compared to other fields. Therefore, even within the same broad educational level, fields of study act as a sorting mechanism where students are channeled through their ability, because only a select group can succeed in challenging fields that carry higher labor market rewards. Conversely, students with less prior ability may choose less challenging and less rewarding fields (Reimer et al., 2008). This may result in more challenging fields of study carrying a higher signaling value to employers than less challenging fields that depend less strongly on prior ability. Thus, ability differences are converted into different signal values in the labor market. For this reason, it would be of value to control for prior ability to examine whether specific fields of study impact labor market integration.

2.4 The role of vocational specificity at the level of educational programs

In the previous section, we discussed the impact of vocational versus general education on individuals, through shaping and channeling individual knowledge, skills and competencies, and consequentially impacting young people's transition from school to work. In this section, we expand on that discussion by examining the impact of educational program characteristics on school-leavers' employment opportunities. An educational program can be described as a specific field of study at a particular level of education (Van der Velden & Wolbers, 2007).

Educational programs do not only have an indirect influence on young people's labor market integration in interaction with individual knowledge, skills and competencies as described, but they also have a direct impact, as the employment opportunities of school-leavers are found to vary widely between educational programs, even within the same educational level (Bishop, 1995; Van der Velden & Wolbers, 2007; Xu, 2013). This implies that youth labor market integration not only depends on the type and amount of knowledge and skills acquired, but also on where individuals have acquired these assets. In this section, we focus on educational programs in upper secondary education, given that much vocational education takes place here, and many students participate in vocational programs at this level before they enter the labor market (Bol & Van de Werfhorst, 2013).

2.4.1 Training costs model

Both human capital and job competition theory share the assumption that employers act rationally and prefer employees with higher levels of prospective labor productivity in relation to the effort it takes to train them. Glebbeek (1988) used this shared assumption to combine the theories into a model of training costs. This model assumes that students are selected based on their expected training costs, which employers cannot individually evaluate but are able to deduce from the average expected training costs of students across a particular educational program (Van der Velden & Wolbers, 2007). The premise is that school-leavers with lower expected training costs will have an advantage in the process of employee selection. Following this model, the expected training costs of school-leavers are determined by three components of educational programs: vocational specificity, program selectivity, and educational level.

Regarding vocational specificity, educational programs differ in the degree to which they specifically prepare students for certain occupations in the labor market. The vocational specificity of educational programs indicates the extent to which vocational skills are emphasized in an educational program rather than more general knowledge and cognitive abilities. The more an educational program provides job-specific skills required for a particular job (or the narrower the occupational profile of an educational program is),

the less additional on-the-job-training school-leavers need. From this line of reasoning, school-leavers from general educational programs are less attractive for employers, because they require more additional on-the-job-training compared to those who finished vocationally oriented educational programs. There is corroborating evidence for different labor market outcomes between vocational and academic programs, in which vocationally trained school-leavers have better employment opportunities than their generally trained counterparts (Arum & Shavit, 1995; Bishop, 1995).

Educational program selectivity refers to having selective entrance criteria based on students' pre-educational program ability and competencies (Klein, 2010). However, even very selective educational programs do not house homogenous groups of students, as there are differences in school-leavers' personal and professional qualities within educational programs that can be hidden behind educational credentials (Glebbeek, Wim, & Schakelaar, 1989). Educational programs differ in the risk they offer that school-leavers will pass the exam without having a minimum level of skills. Highly selective educational programs offer low risks, and vice versa. For employers, this poses a problem because the overperformance of one school-leaver does not simply compensate the underperformance of another (Van der Velden & Wolbers, 2007). If we assume that employers are able to recognize such differences in performance, then this may have an impact on their recruitment behavior and, hence, on the labor market position of school-leavers.

Educational programs can enhance their selectivity by closure strategies, which can take the form of student-in-take restrictions through entrance requirements or tuition fees. Supply restrictions of school-leavers from certain programs are a result of social closure aimed to exclude some of the applicants. In response to restrictions of supply in these programs, labor market rewards tend to increase (Reimer et al., 2008). High labor market returns incite competition between applicants, and therefore, applicants who are more cognitively and/or financially equipped may have the greatest chance to earn a place. This may lead to an increase in average ability levels in more selective programs. As a consequence, highly selective programs offer less uncertainty and signal higher values about school-leavers' quality with regard to their abilities and competencies compared to weakly selective programs.

The training costs model assumes that employers are able to distinguish the different levels and types of selectivity between educational programs, which may influence their recruitment behavior and, subsequently, school-leavers' employment opportunities in the labor market. Employers usually look for highly productive or trainable employees and are therefore keener to select school-leavers who completed more selective educational programs, as they signal higher mean abilities, lower risks of a minimum possession of skills, and less expected training costs compared to school-leavers from less selective educational programs. Thus, according to the training costs model, more selective

educational programs better facilitate school-leavers' employment opportunities than less selective educational programs.

The third part of the model draws on the effort employers have to make to overcome existing skill deficiencies of potential employees. This component is closely related to the general learning abilities of school-leavers and can, therefore, be adequately measured through the educational level of educational programs. Through the eyes of the employer, more educated school-leavers have greater learning capabilities, which lowers the required training costs to overcome school-leavers' skill deficiencies. This may mean that, despite the fact that a particular student possesses vocational-specific skills, general learning abilities are still of importance to bridge skill deficiencies.

To summarize then, educational programs that (a) have higher educational levels, (b) are more selective, and (c) are more vocational specific send clearer signals indicating lower additional training costs for employers. Previous empirical research has found that level of education has the most profound effect on (permanent) employment opportunities, job search duration, and income (Klein, 2010; Van der Velden & Wolbers, 2007). The selectivity of education has a subordinate signal for employers, but it is also found to have an impact on employment opportunities. Finally, the specificity of educational programs has been found to reduce the job search duration (Klein, 2010) and to positively affect employment opportunities (Van der Velden & Wolbers, 2007), giving some evidence for the ecological validity of the training costs model.

2.4.2 Linkage between educational program and labor market

Various sociological studies posit that having educational qualifications with a close linkage to the labor market facilitates the school-to-work transition (Allmendinger, 1989; Shavit & Müller, 2000). It is argued there that educational programs with a strong linkage to the labor market are characterized by having frequent contact and communication with employers, trade unions, and/or labor organizations, and importantly, by having these agents and agencies jointly involved in the design, updating and evaluation of programs' curricula (Iannelli & Raffe, 2007). This close communication and/or collaboration with the labor market sends very clear signals to employers about the potential productivity of school-leavers, suggesting that close linkages between educational programs and the labor market may promote smoother school-to-work transitions.

In most Western countries, general educational programs prepare students for higher education and tend to be weakly related to the labor market, resulting in employers having little insight into the precise knowledge and skills acquired by school-leavers on these programs (De Grip & Wolbers, 2006). In comparison, vocational educational programs usually focus more on preparing students for immediate labor market entry and therefore tend to be more embedded in institutional relationships with the labor market

(Breen, 2005). Vocational programs are argued to contribute more to students' human capital, because the skills acquired are more congruent with and more strongly reflect employers' demands, when employers are more involved in the design of the programs (Iannelli & Raffe, 2007). As a result, vocational programs send clear signals to employers about the productivity of school-leavers, and employers have direct knowledge of and are more readily to trust vocational credentials representing the actual skills required for the job. In addition, vocational educational programs create stronger networks of students and employers, due to internship requirements in the curriculum, which facilitate school-leavers' access to potential future employers and recruitment networks. In addition, employers can gain additional information about interns and can use this knowledge for determining their hiring decisions.

The strength of the linkage can differ between educational programs within the same educational system, which has been referred to as the extent to which educational programs are either generally or vocationally oriented. In general, vocational educational programs maintain a closer linkage with the labor market as opposed to general programs. More recent research has moved away from dichotomizing educational programs in either vocational or general programs (DiPrete et al., 2017). In this research, the vocational specificity of educational programs is measured by the linkage strength between educational programs and occupational positions, in which both level of education and field of study are taken into account. The linkage approach is a more fine-grained measurement of the vocational specificity of education compared to measurements used by previous studies (e.g. Van der Velden and Wolbers, 2007).

2.4.3 Field of study

In the previous section we argued that both human capital and job competition theory bring forth a straightforward explanation of why different fields of study carry different labor market outcomes. Despite the fact that the assumed mechanisms focus on the individual (or school-leaver) level, such as the possession of specific skills and competencies, the majority of studies do not actually examine field-related skills. Instead, most research operationalizes these skills by means of the field of study attained (at a particular educational level), in which these theoretical mechanisms serve as an underlying explanation of differential fields of study effects on labor market outcomes.

Regarding specific fields of study, some scholars make a distinction between 'hard' fields like mathematics, computer science, physics, and engineering versus 'soft' fields like humanities and social studies. Other scholars differentiate between three fields, while some differentiate nine or even more fields (Reimer & Steinmetz, 2007; Smyth, 2005). This variety of classifications makes it somewhat difficult to compare results and discover consistent patterns of labor market returns across studies. However, there is somewhat

consistent evidence that the fields of science, technology, engineering and mathematics (STEM) result in higher labor market returns compared to humanitarian fields (Reimer et al., 2008).

Numerous studies have shown that, in general, employment chances (Reimer et al., 2008; Reimer & Steinmetz, 2007; Smyth, 2005) and occupational status attainment (Smyth, 2005; Van de Werfhorst, 2004) vary between different fields of study, in which "soft" fields have a disadvantage compared to "hard" fields (Reimer et al., 2008). Moreover, it was found that fields of study have an impact at labor market entry (Van de Werfhorst, 2002; Van de Werfhorst & Kraaykamp, 2001). Once again, soft fields have a disadvantage (Klein, 2010). One drawback of the current literature is that most research has focused on higher education and less so on upper secondary education. Considering the theoretical reasons why hard versus soft fields of study have differential labor market returns, it seems plausible that these differences may also apply for upper secondary educational programs. As discussed, another drawback is that there is a lack of clarity around how field of study impacts school leavers' labor market outcomes in relation to educational program effects, individual skills effects, and the combination of both.

2.5 The role of vocational specificity at the level of educational systems

Countries show considerable variation in youth labor market integration. One explanation for these cross-country differences is that macro-economic conditions play an important role in the labor market entry process of young people. Economic downturns increase risks of unemployment and temporary employment (Wolbers, 2014). Still, even when taking macro-economic conditions into account, school-leavers in some countries have to deal with a more problematic labor market integration than school-leavers in other countries, as we discuss later. These findings suggest that other factors than macro-economic circumstances are important in explaining cross-national differences in youth labor market integration.

Comparative research on school-to-work transitions has increasingly acknowledged the importance of institutional arrangements that shape the opportunities for school-leavers in entering the labor market. Many studies have stressed that cross-national differences in school-to-work transitions are shaped by the way that national educational systems are organized (Bol & Van de Werfhorst, 2011; Breen, 2005; De Lange et al., 2014; Levels et al., 2014; Shavit & Müller, 1998; Van der Velden & Wolbers, 2003; Wolbers, 2007a). There is substantial evidence that educational systems with strong vocational characteristics have a closer relationship with labor market outcomes than educational systems with less vocational characteristics (Andersen & Van de Werfhorst, 2010; Scherer, 2005). These findings imply that the relationship between vocational education and labor market

integration is institutionally imbedded, and that its pattern and strength differ between institutional systems of countries (Kerckhoff, 1995).

In this section, we consider institutional characteristics of educational systems affecting school-leavers' labor market integration. The literature on school-to-work transitions often refers to three dimensions as the basis of educational system's capacity to structure school-leavers' entry in the labor market, that is, stratification, standardization and vocational specificity (Kerckhoff, 1995, 2001; Shavit & Müller, 2000). Here, we only focus on the last dimension. We discuss the institutional linkage between the education and employment system of a country, and how this linkage impacts upon youth labor market integration.

2.5.1 Vocational specificity

Educational systems can provide students with either more general skills or more vocational skills, and the amount to which they do so varies between countries. It is well-established that vocationally oriented educational systems help school-leavers in the transition process from education to the labor market (Andersen & Van de Werfhorst, 2010; Bol & Van de Werfhorst, 2011; Van der Velden & Wolbers, 2003; Wolbers, 2007a), and that in these countries youth unemployment is lower compared to countries with limited vocational components in their educational system (Bol & Van de Werfhorst, 2013; Breen, 2005; Wolbers, 2007a; De Lange et al., 2014).

From a theoretical point of view, these findings are generally explained by the acquired (occupational) skills and clear signaling of vocational qualifications that enhance access to the labor market (Van de Werfhorst, 2014). In a more extensive explanation, this means that students gain relevant job-specific skills in vocationally oriented educational systems and it is for this very reason that these educational systems have a clear transparency of the skills acquired compared to more generally or academically oriented educational systems. As a result, educational degrees obtained in vocationally oriented educational systems send very clear and specific signals and information about school-leavers' abilities and potential productivity. It seems plausible that in countries where education is more vocationally oriented, educational degrees hold more information and are therefore more important for occupational attainment (Bol & Van de Werfhorst, 2011).

2.5.2 External differentiation

The link between social inequality and education is that national educational systems contribute to the processes that differentiate people into social strata. Within this perspective, educational systems serve as a "sorting machine", given that they sort students into stratified levels of educational attainment, which are hierarchically ranked (higher vs. lower) by certified credentials. It refers to the extent to which educational

opportunities are differentiated between and within educational levels and refers to the extent in which students are allocated to different tracks in upper secondary education based on achievement or demonstrated ability (Allmendinger, 1989).

Proponents of external differentiation in the form of tracking argue that sorting students into different tracks based on their ability increases classroom homogeneity, allowing more precisely targeted instruction that is more closely aligned with students' needs and is therefore beneficial for students' educational achievements (Figlio & Page, 2002). Moreover, as a result of more fine grained distinctions made between students from various schools, tracks or programs (Van der Velden, 2011b), employers are not only better informed about school-leavers' abilities, but these abilities are also better recognizable through clearer qualification signals (Levels et al., 2014; Müller, 2005). This eases employers' selection and allocation process of potential employees to jobs. Numerous studies have found that countries with differentiated educational systems (especially those with strong vocational components) facilitate youth's school-to-work transitions and lower unemployment risks compared to less differentiated educational systems (Andersen & Van de Werfhorst, 2010; Breen, 2005; Kerckhoff, 2001; Scherer, 2005; Shavit & Müller, 2000; Van de Werfhorst & Mijs, 2010). These findings indicate that highly differentiated educational systems may send stronger and clearer signals to employers about school-leavers' productivity, ability and trainability compared to less differentiated systems, which enhances youth labor market integration.

Although tracking has been a common practice for decades in various Western countries, in recent years, it has received a lot of criticism, as tracking affects social inequality in educational opportunities and subsequently occupational outcomes (Kocer & Van de Werfhorst, 2012; Shavit & Müller, 1998). Opponents to tracking argue that differentiation in educational systems originated to stimulate the reproduction of social classes to maintain social class differences. Tracks are hierarchically ranked – not only in objective terms by means of cognitive level, but also in subjective terms by means of status and prestige – and it is clear which tracks are ranked higher or lower. Various studies on this institutional characteristic of differentiation found detrimental consequences for equality of educational opportunity. Countries with stratified educational systems have larger dispersions of educational achievement than countries with less stratified systems (Hanushek & Woessmann, 2005; Heisig & Solga, 2015; Pfeffer, 2015; Van de Werfhorst & Mijs, 2010). This is especially the case when tracking takes place earlier in upper secondary education. From this perspective, highly differentiated systems legitimize and sustain inequality in educational attainment of individuals, which can also negatively influence their future labor market outcomes (Ainsworth & Roscigno, 2005). Thus, external differentiation of students into different tracks seems not solely based on ability, but also on ascribed characteristics such as social class, and has an impact on young people's opportunities in education, and subsequent labor market entry (Andersen & Van de Werfhorst, 2010; Bol & Van de Werfhorst, 2011; Shavit & Müller, 2000).

2.5.3 Skills transparency

In line with the empirical research that has found a positive impact of the two previously discussed institutional characteristics on youth labor market integration, the prevailing interpretation of these findings in more recent research is that vocational specificity and external differentiation promote 'skills transparency' of both general and vocational skills (Heisig & Solga, 2015). Otherwise stated, the link between educational credentials and school-leavers' actual skills are strengthened by these two institutional characteristics (Andersen & Van de Werfhorst, 2010). The skills transparency refers to the extent to which educational credentials are predictive of actual skills, determining the signal's strength sent to employers about a school-leaver's actual skills. It is assumed that educational credentials send stronger signals about a school-leaver's actual skills – indicating a stronger skills transparency – when: (a) the skills gap between different educational groups is larger and (b) the skills distribution within educational groups is more homogeneous. The first refers to differences between educational groups in the average level of skills. The larger this skills gap is between educational groups distinguished by their educational credentials, the more indicative signals these educational credentials send to employers about school-leavers' actual skills. The second refers to the homogeneity of skills within an educational group, in which the signal is stronger when educational groups are more homogeneous (Aigner & Cain, 1977).

2.5.4 Institutional linkage

The institutional linkage is an important aspect and part of educational systems that are vocationally oriented (Allmendinger, 1989). The strength of the institutional linkage depends on the degree to which the labor market is involved in the design and the administration of the educational system (Shavit & Müller, 2000). Institutional linkages can be organized in various ways and refer to the extent to which theoretical learning is combined with practical work experience. This can be either entirely school-based teaching or a combination of school-based teaching and learning at the workplace (i.e. a 'dual system'). The stronger the institutional linkage, the higher the likelihood that skills taught in the curriculum are actually in demand by employers and the clearer the signals sent to employers about school-leavers' abilities and productive powers (Iannelli & Raffe, 2007). Empirical evidence shows that (vocationally oriented) educational systems with strong institutional linkages (often in the form of the existence of a dual system) lead to a smoother school-to-work transition and lower chances of unemployment (Breen, 2005; Iannelli & Raffe, 2007; Levels et al., 2014; Raffe, 2008; Van der Velden & Wolbers, 2003).

2.5.5 Internal versus occupational labor markets

So far, it has been argued that cross-national variation in youth labor market integration reflects differences in institutional features of the national education and training

system. But there are also scholars who have explained transition patterns through differences in labor market structures. Arguments in this respect are advanced from the perspective of a contrast between qualificational and organizational spaces (Maurice et al., 1986; Shavit & Müller, 1998), and systems of internal labor markets (ILM) versus systems of occupational labor markets (OLM; Gangl, 2001; Marsden, 1999). The basis of such claims is an informational argument. Employers have to make hiring decisions under uncertainty conditions and imperfect information, because the match between job applicants' capabilities and the skills required on the work floor is something that cannot easily determined due to a screening problem (Arrow, 1973). This screening problem can be solved by using different sources of information about job seekers: on-the-job screening, probation periods, previous employment records, and educational qualifications. As employers generally opt for the least costly alternative providing an effective assessment of job applicants, the relative role of education in the job allocation process is larger, the more it offers reliable information about the actual capabilities and skills of individuals.

In the ILM–OLM dichotomy, countries are differentiated based on the extent to which education sends clear and reliable signals about individuals' skills. If education provides clear signals, this will form the basis for achieving adequate job–person matches at labor market entry. From an employer's point of view, then, there is no need to develop and institutionalize firm internal career structures, as recruitment from the external, occupational labor market into (highly) skilled positions is a more viable option. So, in countries with an educational system providing vocational-specific skills, an OLM system exists, whereas in the absence of a sufficiently specific educational system the ILM system is the baseline market arrangement.

Raffe (2008) argues that clustering countries in terms of institutional characteristics is one of the weakest and most arbitrary features of research in transition systems. He describes three challenges that this typology approach faces. First, typologies are only useful when a study covers few countries, but larger numbers of countries easily lead to national differences that cannot be explained by any available typology. In addition, a characteristic of an educational system within a country can be internally heterogeneous. For instance, linkages between education and the labor market may vary across occupational sectors or between educational programs within a country. A final challenge is the lack of robustness in empirical typologies. Studies differ in the way they have grouped countries into different clusters, depending often on the data and analytical techniques used.

2.6 Conclusion

Youth's integration into the labor market is one of the crucial changes young people experience in emerging adulthood (Arnett, 2000). As young people from upper secondary

vocational education experience their final stage of occupational identity formation within the period of emerging adulthood (Bynner, 2005), their initial labor market entry (during this period) influences their future careers and life prospects (Barone & Schizzerotto, 2011; Scherer, 2005; Wolbers, 2007b). The presented overview of theoretical insights and empirical evidence regarding the role of vocational education in youth labor market integration and, more specific, the explicit attention paid to the three levels (i.e. school-leavers, educational programs and educational systems) through which the vocational specificity of education operates, has resulted in an attempt to develop a coherent system of indicators that measure vocational specificity at the three levels. A summary of the key indicators is given in Table 2.1.

The next step therefore is to find adequate operationalizations of these indicators. A few examples are already given in the table. For instance, the attendance of apprenticeship training by upper secondary education students, aimed at acquiring job-specific skills, can be operationalized by various variables, such as the number of firms, the period of apprenticeship training and the number of days per week an apprentice is gaining practical work experience. The task is now to define valid and reliable variables for all the relevant indicators. At the micro level, this may imply the development of new measurement instruments (and new data collection) to determine individuals' generic and job-specific skills levels; at the meso and macro level, the success of this task is dependent upon the availability of descriptions of the content and quality of offered educational programs at educational institutions for vocational education and (time series of) existing databases from statistical offices (for instance, Eurostat or OECD).

When this step is taken, a multilevel analytical strategy will be necessary to simultaneously estimate the impact of these variables at the school-leaver, educational program and educational system level to adequately test the total impact of the vocational specificity of education on the integration of young people into the labor market.

Table 2.1 | Key indicators of vocational specificity on all three levels.

School-leavers	Educational programs	Educational systems
a General versus specific skills: - Literacy skills; - Numeracy skills; - Analytical skills; - Job-specific skills; - Soft skills. **b General vs. vocational qualifications and/or tracks:** - Upper secondary vocational education vs. lower secondary, upper secondary general, or tertiary; - Academic tracks, school-based tracks, and work-based tracks. **c Field of study.** **d Attendance in apprenticeship:** - Number of firms; - Duration of apprenticeship period; - Number of days per week.	**a Vocational specificity of educational program:** - Linkage between educational program and occupational domain. **b Specific vs. generic vocational education programs.** **c Field of study.**	**a Vocational specificity of educational system:** - Percentage of students enrolled in vocational tracks in upper secondary education; - Percentage of students enrolled in upper secondary vocational education that takes place in a dual system. **b Institutional linkage:** - Percentage of students enrolled in upper secondary vocational education that takes place in a dual system per country. **c Internal versus occupational labor markets.**

CHAPTER 3

The micro level:

The role of different types of skills and signals in young people's labor market integration*

* A slightly different version of this chapter has been published as:

Muja, A., Blommaert, L., Gesthuizen, M., & Wolbers, M. H. J. (2019). The role of different types of skills and signals in youth labor market integration. *Empirical Research in Vocational Education and Training, 11*(1), 6.

3.1 Introduction

The transition from school to work is regarded as a precarious period for young people, as they often have to deal with periods of job searching, occupational mismatches and flexible contracts (Levels, Van der Velden, & Di Stasio, 2014; Scherer, 2005; Wolbers, 2003). Education plays a decisive role in preparing youth for the labor market, and the provision of skills and qualifications is therefore one of the key tasks of the educational system (Van de Werfhorst, 2014). This 'labor market task' is most strongly featured in upper secondary vocational education, by providing students with skills that make them productive for work, which ultimately optimizes their labor market perspectives (Van de Werfhorst & Mijs, 2010). As time within a curriculum is limited and a trade-off likely occurs in time spent on acquiring one skill at the expense of the other (e.g. Meng, 2006), it is important to consider which types of skills play a more positive role in graduated school-leavers' labor market integration.

Additionally, in the absence of a readily assessable level of skills, educational signals (Spence, 1973) can be complementary means for employers to assess information about school-leavers' level of productivity, which, if positive, optimizes school-leavers' labor market perspectives (Bills, 2003; Iannelli & Raffe, 2007). Thus, vocational education provides students with different types of skills and signals, both of which are important resources for young people to enter the labor market (Hannan, Raffe, & Smyth, 1997).

This study contributes to this discussion by investigating both the role of different types of self-evaluated skills and signals in school-leavers' labor market integration process, one and a half year after finishing vocational education in the Netherlands. As the school-leavers under investigation reflect on their integration process after eighteen months from graduation, we largely but not solely capture the self-rated skills acquired in education, as these self-perceived skills may have further accumulated on the job and over time. We therefore examine the impact of signals on labor market integration but in the case of self-rated skills, we only examine their relationship with certain labor market outcomes. Our first research question reads as follows: *To what extent are self-rated specific and generic skills and different types of educational signals positively related to the labor market integration process of graduated school-leavers from vocational education in the Netherlands?*

Besides the evident societal relevance for the Netherlands, the findings of this study are also important for other countries, as they lend relevance to the overall question to what extent different types of skills and educational signals are beneficial for youth's labor market integration. Moreover, we want to stress why the Netherlands is an ideal test case for the very purpose of our study. The Dutch upper secondary vocational education and training system (VET; 'MBO' in Dutch) entails variation in vocational specificity both in educational level (four levels with increasing cognitive difficulty). Within each level,

students can choose between a work-based and a school-based track. These variations in vocational specificity within the Dutch VET system provide interesting opportunities to study the role of skills and educational signals among a very comparable group of VET school-leavers.

Our study builds upon insights from existing research by addressing several unanswered questions. First, most previous empirical studies lack measures of job-specific skills on the individual level, because there simply is no such data available (see also Dieckhoff, 2008; Heisig & Solga, 2015; Protsch & Solga, 2015). Barone and Van de Werfhorst (2011) measure specific cognitive skills in their study, but state that their "focus on work-specific cognitive abilities does not pay full tribute to the skills that are rewarded for reasons explained by human capital theory" (p. 488). Furthermore, we found one study that uses the same measures of self-rated specific and generic skills, examining only higher educated school-leavers (Heijke et al., 2003). On the contrary, the measurements of generic skills are quite advanced and well-studied (Bol & Van de Werfhorst, 2013; Heisig & Solga, 2015; Pfeffer, 2015), because of existing accurate measurements that are available in international data collection projects such as the International Adult Literacy Survey (IALS) and the Program for the International Assessment of Adult Competencies (PIAAC), both conducted by the OECD.

This study has measurements of both specific and generic skills, obtained through self-assessed ratings of VET school-leavers' level of skills one and a half years after graduation. We are well aware of biases that can occur due to self-assessments eighteen months after graduating. However, to our knowledge, we are finally able to include a measurement of specific skills (on the micro level), by which we provide a, perhaps not perfect, step forward, and by which we aim to provide new insights on the relation between self-rated specific skills and youth labor market integration.

Second, we argue, among others, that education does not necessarily consist of only one signal in the form of a degree (e.g. Andersen &Van de Werfhorst, 2010; Protsch & Solga, 2015). Our next contribution is to investigate different types of signals and separately theorize why and how each signal affects the labor market integration process. Some of these signals have and others have not yet been investigated. In this study, the signals under investigation are: having attended an internship at the firm (only investigated for the IT-sector among other educational groups in a vignette study, Di Stasio & Van de Werfhorst, 2016), the educational level within the VET system (cross-nationally on the macro level, e.g. Heisig & Solga, 2015), the average graduation grade (e.g. Protsch & Solga, 2015), and the choice between school-based versus work-based tracks (cross-nationally on the macro level, e.g. Andersen & Van de Werfhorst, 2010).

Finally, our third contribution is that we examine whether the impact of self-rated skills and signals differ between various indicators of labor market integration and, if so, for

which of the labor market outcomes the impact is stronger. Although a majority of school-to-work research examines multiple indicators of labor market integration (e.g. Coenen et al., 2015; De Grip & Wolbers, 2006; Levels et al., 2014; Vogtenhuber, 2014; Wolbers, 2007a), they do not *a priori* theorize nor empirically test *whether* and *why* skills and signals have a stronger impact for one outcome *compared* to the other. Consequently, this question has remained underinvestigated to our knowledge. As such, this study examines differences between the following indicators of labor market integration: immediate job entry (after graduation), horizontal job matching (i.e. a match with field of education), vertical job matching (i.e. a match with level of education), and job security (having a permanent employment contract). All in all, the second question this study addresses is: *To what extent does the role of self-rated specific skills and the role of signals vary between different labor market outcomes among graduated school-leavers from vocational education in the Netherlands?*

3.2 Description of the Dutch educational system

To provide a better understanding of the manifestation of the micro level explanations in the next section, it is necessary to provide a better understanding of the Dutch educational system, as the transition takes place within this context. The Dutch educational system is highly stratified (degree of tracking), standardized (degree of nationwide comparability of educational curricula, exit examinations, etcetera), and vocationally specific with strong linkages between education and the labor market (e.g. Kerckhoff, 2001). Based on these institutional features, the Dutch system is often compared to and clustered with German-speaking countries, such as Germany, Switzerland, and Austria (Iannelli & Raffe, 2007; Raffe, 2008; Van der Velden & Wolbers, 2007). In these countries, all characterized by dual or apprenticeship systems, graduated school-leavers experience a smoother transition from school to employment compared to their counterparts from less vocationally oriented educational systems (Iannelli & Raffe, 2007; Raffe, 2008; Scherer, 2005; Wolbers, 2007a).

Another way to increase understandings of the Dutch educational system is to explain the structure of education in the Netherlands. Tracking occurs after primary school when pupils enter secondary education at the age of 12 in which they are allocated to three major tracks. In order of increasing cognitive or academic difficulty, pupils can enter either: (1) pre-vocational education ('VMBO' in Dutch), which gives access to VET ('MBO' in Dutch); (2) senior general secondary education (HAVO), which gives pupils access to tertiary, non-academic education (HBO); or (3) pre-university education (VWO), which gives access to universities (WO).

Of all the educational trajectories, VET (or MBO) is the most occupationally specific and most strongly linked to the labor market and organized in close collaboration with its

social partners (Di Sastio & Van de Werfhorst, 2016; Ministry of Education, Culture, and Science 2016). Within the VET context, students are sorted into four educational levels that differ in cognitive difficulty and admission requirements based on prior educational achievements. With each increasing level, the duration of a (full-time) program also increases, ranging from one to four years. The lowest VET level prepares students for assistant positions in the labor market, whereas the highest level includes middle-management programs, which prepare students for a coordinating and managing occupational position. For example, a lead artisan baker carries out activities for the preparation of bakery products, but is moreover responsible for the execution of the activities in the bakery.

Next, within each VET level, students can choose a vocational program in their field of interest and whether they want to follow this program via a school-based learning route in which at least 20 percent but typically around 30 percent takes place in the workplace ('BOL' in Dutch), or a work-based route in which work and study are combined and at least 60 percent of learning takes place in the workplace ('BBL' in Dutch). In a nutshell, the biggest difference between the two type of tracks is whether students are predominantly trained within the context of the school or firm. The school-based track is a combination of school and internships where students spend most of the time at school. Students in a work-based track or 'apprenticeship pathway' are apprentices at firms and go to school once or twice a week.

3.3 Theoretical background

3.3.1 Skills

We start off by addressing the question of which type of skill, acquired in school and in the labor market by VET school-leavers, is more positively related to labor market returns. From a human capital perspective (Becker, 1964), the general assumption is that – regardless of the type of skills – the more skills individuals acquire in education (general human capital) and within a firm (occupation-specific human capital), the higher their labor productivity, which, in turn, increases their labor market returns. While we agree that all types of skills do increase labor market productivity, we argue that the extent to which this occurs can actually vary between specific and generic skills, depending on the VET system and labor market context (Iannelli & Raffe, 2007; Shavit & Müller, 1998).

So, in order to further theorize which type of skills is more positively related to labor market integration, we first have to take into account the Dutch VET and labor market context. Within the Dutch context of VET, with its strong focus on and strong linkage with the labor market (Hannan et al., 1997; Iannelli & Raffe, 2007), it can be assumed that when VET students have more specific skills, they are better prepared and more immediately

productive on the job (market) compared to when having more generic skills (Hanushek et al., 2017). Theoretically, this suggest that when VET school-leavers have more specific skills rather than more generic skills, they are more likely to experience immediate job entry (Wolbers, 2007a), find a job that matches their skills (Levels et al., 2014), and find permanent employment (Scherer, 2005).

Furthermore, school-leavers' acquisition of job-specific skills does not stop in education, but can be further accumulated in jobs, which is in accordance with occupation-specific human capital theory (Becker, 1964). These acquired skills are, to some extent, transferrable to other firms as well (e.g. Lazear, 2009). Thus, whether school-leavers have acquired job-specific skills in school or within a firm, the more job-specific skills they have accumulated over time, the more prosperous their labor market returns. Based upon these arguments, our first hypothesis reads:

Among VET school-leavers, having more self-rated specific skills is more positively related to immediate job entry (H1a), horizontal matching (H1b), vertical matching (H1c) and job security (H1d) than having more self-rated generic skills.

3.3.2 Signals

Next to the role of skills, we address the question regarding the relation between school-leavers' educational signals and labor market integration. In contrast with school-leavers' acquisition of skills in both education and the labor market, educational signals are obtained in education. Spence (1973) argues that employers have little information about the actual level of job seekers' productive skills and use educational degrees instead as a 'signal' that contains information about one's potential productivity, ability, and trainability (Arum & Shavit, 1995). Moreover, these degrees represent other unobserved qualities of job seekers, such as commitment, perseverance, and motivation (Arrow, 1973; Bol & Van de Werfhorst, 2011).

What is then the use of signaling for employers concretely? When job seekers' actual level of skills is imperfect, limited, or not at all observable for others, the use of signals is very valuable as complementary means for employers, as they send additional information about job seekers' productive capacity which can optimize their labor market perspectives (Bills, 2003). This suggests that school-leavers' educational signals can have a relationship with labor market integration independently and complementary of the relationship with school-leavers' skills.

Again, the clarity of vocational educational signals depend on the educational and labor market context (Meng, 2006; Vogtenhuber, 2014). As mentioned earlier, the Dutch VET context has a strong focus on and linkage with the labor market. Previous research has found that in countries with strong linkages between education and the labor market, strong and clear signals are sent between the two contexts (Hannan et al., 1997; Iannelli

& Raffe, 2007; Raffe, 2008; Vogtenhuber, 2014). Moreover, the stronger this linkage, the more positive is the impact of vocational signals on labor market outcomes for VET school-leavers (Iannelli & Raffe, 2007). Based upon this, we argue that employers receive informative and clear signals from the upper secondary vocational education in the Netherlands.

The question remains to what extent the four educational signals (internship at the firm, type of track, VET level, and graduation grade) under investigation are positively related to labor market integration among VET school-leavers. In other words, when, why and how does each educational signal send a more positive signal?

The first educational signal under investigation is having completed an apprenticeship, which is a regular feature in Dutch upper secondary VET. According to network theories (e.g. Rosenbaum et al., 1990), one of the reasons why vocational education has a positive impact on labor market integration, is because vocational programs give students access to possible future employers and/or their networks (Iannelli & Raffe, 2007). This access becomes available through the strong linkage between VET programs and the labor market, resulting in a closer involvement of employers, which can facilitate closure via networks (Di Stasio & Van de Werfhorst, 2016; Iannelli & Raffe, 2007; Rosenbaum et al., 1990). This access can additionally be established through apprenticeship training or a prior (paid) job, which provides employers direct information about students' level of productivity or trainability, but also otherwise more difficult to observe qualities, such as commitment, perseverance, and motivation. Di Stasio and Van de Werfhorst (2016) state that "following the closure by networks argument, employers should favor applicants with a pre-existing relation with the firm to compensate for poor education signaling" (p. 84). They argue that this would especially be the case in weakly stratified and more generalist educational systems. Although we do not disagree with the authors' line of reasoning within their framework, we do still expect a positive impact of a pre-existing relationship with a firm through an apprenticeship (or a paid job) as it simply provides first-hand, direct information about one's productivity and (train)ability – even when the signaling power of education is quite strong, as is the case in Dutch upper secondary VET.

All in all, we argue that a positive pre-existing relationship with a firm can strongly increase school-leavers' chances of getting a job in the firm after graduation (Di Stasio & Van de Werfhorst, 2016; Levels et al., 2014). This positive impact seems very common in countries with a dual apprenticeship system or a work-based VET system, as many apprentices stay with their firm as an employee after completing their apprenticeship (Protsch, 2017). Hence, our second hypothesis reads as follows:

> *Among VET school-leavers, a pre-existing relationship with a firm through an internship or a (paid) job is more positively related to immediate job entry (H2a), horizontal matching (H2b), vertical matching (H2c) and job security (H2d) than not having a pre-existing relation with a firm.*

Second, in most cases VET students can follow either a work-based track (at least 60 percent of learning takes place in the workplace) or a school-based track (typically around 30 percent takes place in the workplace) of their program. Because of its clearer and stronger vocational specificity, we argue that school-leavers who completed a work-based track signal more on-the-job experience, which, as a consequence, also signals that these school-leavers are better prepared and more immediately productive on the job than school-leavers from a school-based track. Our third hypothesis therefore reads:

Among VET school-leavers, finishing a work-based track is more positively related to immediate job entry (H3a), horizontal matching (H3b), vertical matching (H3c) and job security (H3d) than finishing a school-based track.

Third, the Dutch VET system consists of four levels with increasing (cognitive) difficulty. Based on signaling theory, one's productivity, ability, and trainability is judged based on signals of educational attainment (Spence, 1973). The lower one's educational attainment or degree is, the lower the rank in the labor queue will be (Gesthuizen, Solga, & Künster, 2010). We therefore expect that students with a higher VET level send a more positive signal to employers compared to students with a lower VET level. This suggests the following hypothesis:

Among VET school-leavers, finishing higher levels of education within VET is are more positively related to immediate job entry (H4a), horizontal matching (H4b), vertical matching (H4c) and job security (H4c) than finishing lower levels of education within VET.

Finally, signaling and queuing approaches stress the importance of grades as cheap and easy-to-observe signals of cognitive ability or trainability (see also Di Stasio & Van de Werfhorst, 2016; Protsch, 2017; Protsch & Solga, 2015). Similar to these previous studies, we examine the average graduation grade. For employers, higher grades signal perseverance, and trainability potential, and are indirectly related to productivity (Di Stasio & Van de Werfhorst, 2016; Protsch & Solga, 2015; Weiss, 1995). These signals are attractive for employers, as they benefit most from employees who are productive and require little training, saving additional training costs (Thurow, 1976). We thus predict that the higher school-leavers' average graduation grade is, the more positive the signal is to employers because it indicates an overall higher level of ability, trainability, motivation, and perseverance (see also Protsch & Solga, 2015). This leads to the next hypothesis:

Among VET school-leavers, obtaining higher average graduation grades is more positively related to immediate job entry (H5a), horizontal matching (H5b), vertical matching (H5c) and job security (H5d) than obtaining lower average graduation grades.

3.3.3 Differences between labor market outcomes

The extent to which the impact of signals and skills may be different between various indicators of labor market integration remains both theoretically and empirically unclear.

Consequently, it also remains somewhat unclear whether and why signals and skills have a stronger impact on one labor market outcome *compared* to the other.

Educational signals have proven to be a very important means for employers to screen applicants, especially when dealing with job seekers who are trying to enter the labor market for the first time (Brzinsky-Fay, 2017; Hannan et al., 1997). As information about applicants' productivity is imperfect during the first stages of hiring processes, employers often resort to educational signals, which are available before hiring as an indication of applicants' productivity or trainability (Protsch & Solga, 2015; Spence, 1973; Thurow, 1976). Hence, school-leavers may have greater chances in experiencing immediate entry by means of their educational signals compared to job matching and job security, because the latter outcomes are accompanied by greater risks of additional costs which employers can prevent by not making these decisions based on incomplete information about one's productivity (i.e. educational signals). This leads to the following hypothesis:

For VET school-leavers, educational signals are more positively related to immediate job entry, compared to horizontal matching (H6a), vertical matching (H6b) and job security (H6c).

Next, we expect school-leavers' job-specific skills to be relatively more important when it comes to having a matching job and obtaining permanent employment compared to immediate entry. The allocation of applicants to a matching or permanent job is a risky hiring decision for employers to make under imperfect information conditions, because it is accompanied by either additional training costs (in order to match one's skills to the job) or higher firing costs regarding permanent contracts compared to temporary contracts (Levels et al., 2014; Noelke, 2015; Scherer, 2005). These risks can be reduced by relying on more direct information about applicants' productivity: their skills. Against this background, we argue that school-leavers' specific skills are more positively related to these outcomes compared to immediate entry into the labor market, assuming that first entry jobs are allocated on the basis of signals and entail minimal risks for employers. This suggests our final hypothesis:

For VET school-leavers, self-rated specific skills are more positively related to horizontal matching (H7a) vertical matching (H7b) and job security (H7c) than to immediate job entry.

3.4 Data and measurements

To test our hypotheses, we use data from the 2015 VET survey ('BVE monitor' in Dutch) carried out by the Research Centre for Education and the Labor Market (ROA) of Maastricht University. This annual survey is designed to analyze the transition of graduated school-leavers from VET to continuous education or the labor market. For this purpose, school-leavers are questioned one and a half year after their graduation by means of either the written or online version of the questionnaire. The survey collects information about

school-leavers' educational career in retrospect, as well as information on their current educational and labor market activities.

Given the focus on VET school-leavers' first entry into the labor market, we had to select respondents on a number of criteria to capture their initial school-to-work transition. The most important and inevitable selection is that school-leavers had to have a paid job at the time of the survey, as only these respondents had to answer (further) questions regarding their employment. All in all, we selected VET school-leavers who at the time of the survey (a) are aged between 18 and 27, (b) do no longer study, (c) have not obtained another (higher) degree during that year and a half, (d) have a paid job, and (e) are not self-employed or working freelance. Furthermore, according to the widely used International Standard Classification of Education (ISCED), upper secondary VET is equal to ISCED 3. We therefore restricted our analyses solely to respondents from VET levels 2, 3 and 4, because the other VET levels 1 and 4+ (specialist training) are equal to respectively ISCED 2 and ISCED 4. The data sample relevant for our study ultimately consisted out of 8,257 respondents.

3.4.1 Labor market outcomes

Immediate job entry was measured with the question: "Have you been unemployed after you finished the VET program?". A majority of the respondents (81.1 percent) indicated to have not experienced unemployment after their program, meaning they experienced immediate job entry (1) as opposed to a delayed entry (0). This skewed distribution was also found in the original data sample (82.7 percent experienced immediate entry) before any selections were implemented.

Horizontal job matching indicates whether (1) or not (0) respondents have a current job for which their employer(s) had asked for a matching (or a related) field of study. Vertical job matching indicates whether (1) or not (0) school-leavers have a current job for which their employer(s) had asked a matching level of education.

Finally, *job security* indicates whether school-leavers have a permanent employment contract (1) versus a temporary or zero-hour contract (0). Job security was measured with the question concerning the *type of contract*, comprising of three categories: "permanent employment", "temporary employment", and "not applicable". Respondents who had missing scores or answered "not applicable" on this question, but did answer the question regarding *type of employment* with "zero-hour contract", were included and coded as dealing with job insecurity.

After we excluded missing values for the dependent variables (16.0 percent) through listwise deletion, the sample was reduced to 6,938 respondents. Although this seems like a high percentage of respondents with missing values to simply exclude from the sample, within this group of respondents around half of them (48.7 percent) had not answered

more than 60 percent of the questions that all respondents were asked in the survey. If we would disregard this group, a total of 8.9 percent of the missings on the dependent variables would be found among respondents that actually had valid answers on the majority of the survey.

3.4.2 Self-rated specific and generic skills

The explanatory variable *specific skills*[1] was measured using a self-reporting approach in which respondents were asked to indicate their own level of skills on a 5-point Likert scale, ranging from mediocre to excellent. Based on the literature, the items related to specific skills were "vocational knowledge" and "the ability to apply vocational knowledge and techniques in practice" (Van der Velden, 2011a). The average score of these two items was taken to construct a measure of specific skills (Cronbach's alpha of 0.64). This may not seem as a very high degree of reliability, but it is important to keep in mind that the reliability test is also affected by the number of items included. Generally, more items lead to a higher degree of reliability. To take this into account, we calculated the Spearman-Brown prophecy formula in order to predict the reliability of the test after changing the test length (number of items). If we had the double amount of items, in this case four instead of two items, the Cronbach's alpha would be 0.77, which is reasonably high.

In addition, *generic skills* were measured with the same self-reporting approach. In accordance with previous literature, the following three items have been used to measure basic generic skills: written, oral, and numeracy skills (Meng, 2006; Van der Velden, 2011a). These three components of generic skills are internationally examined as such, by means of widely used assessments, such as the IALS and PIAAC, both conducted by the OECD. The average score of these items was calculated to have one overall measure of generic skills (Cronbach's alpha of 0.61). Again, we calculated the Spearman-Brown formula and doubled the number of items to six, which led to a Cronbach's alpha of 0.75. In case of both types of skills, a higher score indicates a higher self-reported level of specific or generic skills. A positive correlation was found between the scaled specific and generic skills (Pearson's $r = 0.412$, $p < 0.001$). Respondents with missing values on both specific and generic skills were listwise excluded from the sample (total of 12.6 percent).

3.4.3 Educational signals

First, *apprenticeship at firm* was measured with the question: "Did you do an internship or did you have a (paid) job at this (current) company/organization during your VET program?". The response categories were recoded into yes (1) or no (0). Missing values were recoded into a separate category/dummy.

Next, the *type of track* indicates whether school-leavers attended the school-based VET track (BOL) (0) or the work-based VET track (BBL) (1). We assume that the work-based track

sends a more positive signal about school-leavers' labor productivity to employers than the school-based track. These two groups differ in some characteristics from each other. For example, men and older students (24 years and older) more often choose a work-based track (50.7 percent and 39.8 percent, respectively) rather than a school-based track (31.9 percent and 14.4 percent). We take these differences between the groups into account by controlling for these and other characteristics in all our models.

Third, respondents had to indicate which of the following *educational levels in VET* they had completed: basic vocational training, level 2, vocational training, level 3, and middle management training, level 4. We recoded these levels into dichotomous variables.

Finally, the respondents were asked to indicate their *average graduation grade* (approximately) for all subjects. The grades in the Dutch educational system range from 1 (very poor) to 10 (outstanding). Grades of 6 and higher are needed in order to pass the exams. Respondents were to choose between grades ranging from a "6.0" to "8.5". Cases with missing values (0.8 percent) on this measurement were deleted. In sum, 13.3 percent of the respondents with missing values on (one of) the independent variables were excluded. Our final analytical sample size consisted out of 6,014 graduated school-leavers.

3.4.4 Control variables

We included educational sector, gender, age, migration background, and parental educational background as control variables, as these factors could be common causes of both skills and signals, and school-leavers' labor market outcomes. *Educational sectors* within Dutch VET education can be categorized into five broader subject fields (Ministry of Education, Culture and Science, 2016, p. 12; OECD, 2016a, p. 28). Accordingly, we measured the following five categories: "economics", "technology", "agriculture", "health care", and "social work/welfare". Gender was coded (0) for men and (1) for women. Age was measured in years. *Migration background* indicated whether at least one of the parents was born in a western or non-western foreign country, which is in line with the definition used by Statistics Netherlands (2018a). We distinguished four categories: "native Dutch", "western migration background", "non-western migration background", and "missing information". *Parental educational background* was measured by the highest level of education attained by one of the parents, and is comprised of five categories: "primary education", "lower secondary education", "upper secondary general education", "upper secondary vocational education", and "tertiary education". Missing information from one or both parents was grouped in a separate category. The descriptive statistics for all variables can be found in Table 3.1.

3.5 Methods

To test hypotheses 1 to 5, we conducted binomial logistic regression models because all four labor market outcomes are dichotomous. To provide a better overview of the results, we only present the full models in Table 3.2, as the results did not substantially differ from the models including only the skills or signal variables and controls.

Additional statistical methods were required for empirically testing hypotheses 6 and 7. For these hypotheses, we needed methods that are able to statistically test whether or not significant differences are found between the same predictor and the three labor market outcomes. We therefore conducted a generalized structural equation model (GSEM) analysis for which the average marginal effects were obtained, followed by a post-estimation Wald test (see Table 3.3). The GSEM analysis enabled us to run the models on the three outcome variables simultaneously, and provided the exact same outcomes (B-coefficients and average marginal effects) as the binomial logistic regression models presented in Table 3.2. After that, post-estimation Wald tests were conducted on the average marginal effects to investigate whether one predictor variable was significantly differently associated with one labor market outcome compared to the other, by imposing equality constraints on the coefficients and then evaluating the change in model fit (based on the Chi^2 statistic), combined with its significance. Positive significant values then exemplify that the average marginal effects differ significantly from each other. To determine whether the predictor variable had a stronger relation with either the one or the other labor market outcome, we compared the effect sizes of the average marginal effects from the binomial logistic regression models, as they are identical to the average marginal effects from the GSEM models.

3.6 Results

3.6.1 Self-rated specific versus generic skills and labor market integration

Table 3.2 shows the parameter estimates and average marginal effects of the binomial logistic regression models. Our results show that, among VET school-leavers, having more self-rated specific skills is indeed more positively related to immediate job entry (H1a), job matching (H1b) and job security (H1c) compared to having more self-rated generic skills. These findings are in accordance with hypothesis 1. Although we found different relationships between both types of self-rated skills and our labor market outcomes, a significantly positive association is found between self-rated specific and generic skills when conducting linear regression models including all variables at once and the labor outcomes in turns. This re-confirms the fact that even though both self-rated skills are positively and robustly correlated with one another, they do have different associations with the labor market outcomes under investigation.

Table 3.1 | Descriptive statistics of all variables.

	Min	Max	Mean	SD
Dependent variables				
Immediate job entry	0	1	0.81	
Horizontal match	0	1	0.71	
Vertical match	0	1	0.74	
Job security	0	1	0.37	
Self-rated skills				
Self-rated specific skills	1	5	3.87	0.63
Self-rated generic skills	1	5	3.79	0.66
Educational signals				
Apprenticeship at firm				
No (= ref.)				
Yes	0	1	0.49	
Missing	0	1	0.00	
VET track				
School-based (= ref.)				
Work-based	0	1	0.25	
Educational VET level (level 2= ref.)				
VET level 3	0	1	0.30	
VET level 4	0	1	0.56	
Average graduation grade	6	8.5	7.32	0.54
Controls				
Educational sector				
Economics (= ref.)	0	1	0.28	
Agriculture	0	1	0.06	
Technology	0	1	0.23	
Social work/welfare	0	1	0.14	
Health care	0	1	0.29	
Female (male = ref.)	0	1	0.63	
Age	18	27	22.05	1.92
Migration background				
Native Dutch (= ref.)	0	1	0.32	
Western migration background	0	1	0.20	
Non-western migration background	0	1	0.24	
Missing	0	1	0.08	
Parents' education				
Primary education (= ref.)	0	1	0.02	
Lower secondary education	0	1	0.18	
Upper secondary gen. education	0	1	0.06	
Upper secondary VET education	0	1	0.39	
Tertiary education	0	1	0.28	
Missing	0	1	0.07	

Source: VET survey 2015; N = 6,014.

Unexpectedly, school-leavers with higher levels of self-rated generic skills are negatively associated with horizontal job matching. Perhaps this finding indicates that generic skills are indeed a means of diversion for job seekers, as these skills can be used well outside their own occupational domain, resulting in more flexibility on the labor market and therefore also increased chances of job mismatching (Borghans & De Grip, 1999). Another alternative explanation is that horizontal job mismatches occur more often in less occupation-specific jobs, and as a result, school-leavers may have developed more (self-rated) generic skills in these jobs.

Regarding our control variables, we found that healthcare school-leavers have higher labor market chances on all outcomes than their counterparts from economics. Moreover, school-leavers from social work/welfare have overall lower labor market chances than the economics group. Next, we observed that women are less likely than men to experience immediate entry or a secure job. Regarding age, we found that older school-leavers have lower chances of immediate entry, but higher chances of a vertical matching job. Lastly, school-leavers with a non-western migration background are, on average, less likely to experience immediate job entry, horizontal matching, vertical matching (although marginally) and job security compared to school-leavers with a native Dutch background. In addition, school-leavers with a western migration background only have lower chances of finding a vertical matching job than native Dutch school-leavers.

3.6.2 Educational signals and labor market integration

Table 3.2 also shows the results regarding the impact of educational signals on school-leavers' labor market outcomes (see hypotheses 2, 3, 4, and 5). Overall, these findings indicate that school-leavers' higher level of self-rated specific skills and (most of) the educational signals are, independently of one another, positively related to youth labor market integration.

First, having a pre-existing relationship with a firm (through an internship or a prior job during the VET program) increases school-leavers' chances on all four labor market outcomes. The same is largely true for school-leavers who finished a work-based track, but with the exception of finding a vertical matching job. For the majority of the outcomes, these results thus indicate that a work-based track sends a strong positive signal to employers, independently of school-leavers' pre-existing relationship with the firm. Support is found for hypotheses 2 and 3, with the exception of H3c (vertical matching). These findings suggest that network mechanisms and signals of on-the-job experience (i.e. immediate productivity) may be important signals for VET school-leavers to send to employers.

Second, school-leavers from VET level 3 and level 4 are both more likely to experience immediate job entry, horizontal matching and job security compared to school-leavers from level 2. Interestingly, only in the case of vertical matching no significant differences are found between school-leavers from level 2 and 3. Moreover, school-leavers from level 4 are more likely to experience a vertical job match compared to those from both level 3 (AME = 0.103) and level 2. To conclude, it seems that those school-leavers that have attained the highest level within VET have significantly more chances to find a job that matches their educational level within VET (i.e. vertical matching) compared to those from lower VET levels. This can possibly be explained by the monopolizing position of VET level 4 occupations among VET school-leavers. Those with higher educational levels (within VET) are able to cascade down on the VET occupational ladder, whereas job seekers with lower attained VET levels are not eligible for occupations that require a level 4 degree. Their access is restricted, because they do not hold the required licensure or certificate. This 'closure by degree argument' (Bol & Weeden, 2015) for increased chances of vertical matching among VET level 4 school-leavers seems plausible, as these programs prepare students with additional specializations and hold managerial, coordinating responsibilities.

In addition to this, having a pre-existing relationship with the firm, thus network mechanisms, seem to increase chances of finding a job that matches school-leavers' educational level. Moreover, the chances of finding a vertical matching job depend on the sectors in which school-leavers are looking for a job. School-leavers from healthcare have the strongest chances of finding a job that matches their level of education. This finding is not surprising and can be explained by processes of credentialing and occupational regulations often strongly prevalent in healthcare occupational positions; these processes are argued to restrict access to holders of a particular certificate or licenses (Bills, 2003; Bol & Weeden, 2015).

Lastly, with respect to average graduation grade, results show that higher average graduation grades among school-leavers are indeed more positively related to job matching and job security, supporting most of hypothesis 5. As this does not hold true for immediate entry, we cannot confirm H5a. A possible explanation for the latter may be that signals of on-the-job experience (work-based track) and network mechanisms (internship at firm) may be more important for increasing school-leavers' chances of immediate job entry.

Table 3.2 | Binomial logistic regression models including average marginal effects of VET school-leavers' labor market outcomes.

	Immediate entry				Horizontal match				Vertical match				Job security			
	ame[1]	(se)	b	(se)	ame	(se)	b	(se)	ame	(se)	b	(se)	ame	(se)	b	(se)
Self-rated Skills																
Specific skills	0.033***	(0.008)	0.251***	(0.060)	0.103***	(0.009)	0.581***	(0.054)	0.056***	(0.009)	0.316***	(0.053)	0.041***	(0.010)	0.210***	(0.053)
Generic skills	0.002	(0.008)	0.016	(0.059)	-0.040***	(0.009)	-0.226***	(0.052)	-0.013	(0.009)	-0.072	(0.052)	-0.008	(0.010)	-0.042	(0.050)
Educational Signals																
Apprenticeship at firm																
No (= ref.)																
Yes	0.207***	(0.010)	1.558***	(0.083)	0.177***	(0.011)	1.000***	(0.064)	0.085***	(0.011)	0.477***	(0.064)	0.213***	(0.011)	1.087***	(0.060)
Missing	0.177~	(0.098)	1.331~	(0.742)	0.119	(0.092)	0.673	(0.517)	0.158	(0.111)	0.889	(0.625)	0.319***	(0.085)	1.626***	(0.432)
VET track																
School-based (= ref.)																
Work-based	0.105***	(0.014)	0.788***	(0.108)	0.116***	(0.015)	0.656***	(0.088)	0.004	(0.015)	0.022	(0.082)	0.221***	(0.014)	1.127***	(0.075)
VET level 2 (= ref.)																
Level 3	0.071***	(0.016)	0.535***	(0.118)	0.102***	(0.018)	0.575***	(0.101)	-0.025	(0.017)	-0.143	(0.097)	0.070***	(0.019)	0.355***	(0.099)
Level 4	0.079***	(0.015)	0.593***	(0.112)	0.124***	(0.017)	0.701***	(0.097)	0.077***	(0.017)	0.437***	(0.097)	0.076***	(0.019)	0.385***	(0.098)
Average grad. grade	0.003	(0.009)	0.025	(0.067)	0.031**	(0.010)	0.173**	(0.059)	0.028**	(0.010)	0.156**	(0.059)	0.021~	(0.011)	0.106~	(0.056)
Controls																
Educational sector																
Economics (= ref.)																
Agriculture	-0.037~	(0.020)	-0.282~	(0.154)	0.030	(0.023)	0.170	(0.129)	0.005	(0.023)	0.030	(0.129)	-0.039	(0.026)	-0.198	(0.133)
Technology	-0.033*	(0.014)	-0.252*	(0.103)	0.098***	(0.015)	0.556***	(0.088)	0.036*	(0.015)	0.206*	(0.087)	0.029~	(0.017)	0.150~	(0.085)
Health care	0.035**	(0.014)	0.268**	(0.103)	0.177***	(0.015)	1.001***	(0.088)	0.151***	(0.016)	0.853***	(0.090)	0.018	(0.016)	0.092	(0.081)
Social work	-0.044**	(0.015)	-0.332**	(0.114)	0.073***	(0.018)	0.410***	(0.100)	0.041*	(0.018)	0.232*	(0.102)	-0.130***	(0.022)	-0.663***	(0.111)

Female (male = ref.)	-0.028*	(0.012)	-0.209*	(0.088)	0.006	(0.013)	0.035	(0.075)	0.007	(0.013)	0.037	(0.076)	-0.031*	(0.014)	-0.160*	(0.074)
Age	-0.014***	(0.003)	-0.107***	(0.020)	0.004	(0.003)	0.024	(0.018)	0.010**	(0.003)	0.058**	(0.018)	0.003	(0.003)	0.017	(0.017)
Migration background																
Native Dutch (= ref.)																
Western	0.034	(0.024)	0.260	(0.178)	-0.042~	(0.025)	-0.238~	(0.144)	-0.071**	(0.025)	-0.398**	(0.141)	-0.002	(0.028)	-0.010	(0.145)
Non-western	-0.097***	(0.017)	-0.733***	(0.132)	-0.069**	(0.022)	-0.389**	(0.123)	-0.043~	(0.022)	-0.242~	(0.124)	-0.053*	(0.026)	-0.272*	(0.130)
Missing	-0.022	(0.059)	-0.163	(0.441)	0.132~	(0.080)	0.747~	(0.450)	0.153~	(0.088)	0.865~	(0.497)	-0.051	(0.073)	-0.258	(0.374)
Parents' education																
Elementary (= ref).																
Lower secondary	-0.024	(0.038)	-0.185	(0.286)	-0.047	(0.043)	-0.266	(0.241)	0.009	(0.041)	0.054	(0.231)	-0.013	(0.046)	-0.068	(0.233)
Upper sec. gen.	-0.070~	(0.040)	-0.527~	(0.305)	-0.050	(0.046)	-0.282	(0.260)	-0.040	(0.044)	-0.227	(0.248)	-0.016	(0.050)	-0.080	(0.253)
Upper sec. VET	-0.054	(0.037)	-0.409	(0.280)	-0.025	(0.042)	-0.140	(0.238)	0.038	(0.040)	0.214	(0.227)	-0.042	(0.045)	-0.216	(0.229)
Tertiary	-0.075*	(0.037)	-0.568*	(0.282)	-0.025	(0.042)	-0.143	(0.240)	0.044	(0.041)	0.245	(0.230)	-0.028	(0.045)	-0.142	(0.231)
Missing	-0.044	(0.040)	-0.330	(0.303)	-0.062	(0.046)	-0.351	(0.257)	-0.001	(0.044)	-0.004	(0.247)	0.010	(0.049)	0.053	(0.250)
Intercept			2.083**	(0.689)			-3.649***	(0.601)			-3.126***	(0.594)			-3.272***	(0.565)
Log likelihood			-2517				-3189				-3212				-3471	

Note. [1] *AME = average marginal effect.*
*Source: VET survey 2015; N = 6,014. *** p <0.001, ** p <0.01, * p <0.05, ~ p <0.10 (two-tailed).*

3.6.3 Differences between labor market outcomes

The GSEM analysis combined with the post-estimation Wald Test (see Table 3.3) provides information to test hypotheses 6 and 7. Hypothesis 6 states that the impact of educational signals is more positively related to immediate job entry compared to horizontal matching (H6a), vertical matching (H6b) and job security (H6c).

First, regarding apprenticeship at the firm, Table 3.3 shows that its impact is different between job entry and both horizontal ($Chi^2 = 3.94$) and vertical matching ($Chi^2 = 64.19$). Turning to the average marginal effects in Table 3.2, the positive apprenticeship impact is stronger for job entry than for horizontal and vertical matching, which is in line with our expectations. No significant differences are found between job entry and job security in Table 3.3. This finding indicates that network mechanisms and/or (on-the-)job experience are as important for increasing chances of immediate entry as it is for increasing chances of permanent employment in the first eighteen months of school-leavers' integration process. In order to explain the remaining findings as clearly as possible, we will discuss these more straightforwardly.

Next, the impact of type of VET track differs significantly between job entry and both vertical job matching ($Chi^2 = 24.54$) and job security ($Chi^2 = 34.99$). School-leavers' type of VET track more strongly increases chances of job entry than vertical matching. Unexpectedly, type of VET track more strongly increases school-leavers' chances of job security rather than job entry. This finding indicates that having accumulated more (on-the-)job experience strongly increases school-leavers' chances of having a permanent employment contract within eighteen months after school-leaving.

Third, and in line with our expectations, the impact of VET level 3 is significantly larger for immediate job entry than for vertical job matching. On the contrary, we found that signals of completing VET level 4 and average graduation grade more strongly increase chances of horizontal matching than job entry, which does not corroborate with hypothesis 6. Possibly, signals of overall trainability are more important for finding a job within one's field, whereas for immediate entry apprenticeship training and a work-based track seem most important.

Altogether, these findings partly confirm hypothesis 6: only the impact of school-leavers' apprenticeship is stronger for job entry than for horizontal and vertical matching. In addition, the impact of completing a work-based track and that of VET level 3 have a stronger positive impact on job entry than vertical matching. Unexpectedly, the impact of the other educational signals either (a) do not differ between job entry and the other labor outcomes (see Table 3.3) or (b) do differ significantly, but in the opposite direction than predicted (see Table 3.2, i.e. the impact of VET level 4 and average graduation grade is stronger for horizontal matching, and the impact of the work-based track is stronger for job security).

Lastly, hypothesis 7 states that school-leavers' self-rated specific skills are more positively related to horizontal matching (H7a), vertical matching (H7b) and job security (H7c) than to immediate job entry. Results in Table 3.3 show that school-leavers' self-rated specific skills do significantly differ in relation to immediate entry and horizontal matching, and is indeed stronger for horizontal matching than immediate entry. However, the association between self-rated specific skills and the other labor market outcomes under investigation do not significantly differ from one another. We therefore reject H7b and H7c: self-rated specific skills are as important for immediately entering a job as these are for allocating school-leavers to a vertical matching job and a secure job.

Table 3.3 | Post-estimation Wald tests with Chi-square test statistics (X2): Comparing labor market outcomes.

			Signals				
		Specific skills	Apprentice-ship	Work-based track	VET level 3	VET level 4	Average grad. grade
		X^2	X^2	X^2	X^2	X^2	X^2
Job entry	Horizontal match	32.73***	3.94*	0.31	1.73	4.09*	4.01*
Job entry	Vertical match	3.44~	64.19***	24.54***	17.14***	0.00	3.16~
Job entry	Job security	0.37	0.21	34.99***	0.00	0.02	1.54

*Source: VET survey 2015; N = 6,014. *** p <0.001, ** p <0.01, * p <0.05, ~ p <0.10 (two-tailed).*

3.7 Discussion

This study first of all aimed to answer the question: *To what extent are self-rated specific and generic skills and different types of educational signals positively related to the labor market integration process of graduated school-leavers from vocational education in the Netherlands?* With respect to the first part of this research question, a careful interpretation we can provide is that self-rated specific skills – acquired either in education or on-the-job – seem more positively related to favorable labor market outcomes than generic skills in the first eighteen months of school-leavers' integration process. These findings do not seem to corroborate with human capital's general assumption that regardless of the type of skills, the more skills, the better the labor market returns, as we have found that the different types of self-rated skills are actually differently associated with labor market integration. This suggests that the extent to which the type of self-rated skills positively relate to labor market integration might depend on the educational and labor market context, which is in line with what most previous (cross-national) studies have theorized as well (Andersen & Van de Werfhorst, 2010; Di Stasio & Van de Werfhorst, 2016; Iannelli & Raffe, 2007; Raffe, 2008; Wolbers, 2007a). Accordingly, we encourage future research to place human capital theory within the educational and labor market context in order to further disentangle the impact of various types of (self-rated) skills on youth labor market integration.

However, it is important to not turn a blind eye for reversed causality in that a favorable labor market outcome might lead to a higher self-assessment of job-specific skills compared to generic skills (although there is a positive and robust relationship between both types of skills). Taking this causality issue into account, the answer would be to stay keen in ensuring that students enrolled in VET (also) develop generic skills. Besides the likely situation that in some occupations generic skills are in part also specific skills, generic skills are especially important with regard to VET students' opportunities to access higher levels within VET or to access tertiary, non-academic education. Given that the VET system not only prepares its students for the labor market, but also serves as a(n indirect) pathway to tertiary non-academic education, in particular for those from lower social origins, a relevant question remains to what extent the emphasis on specific skills within VET increases educational inequality by dampening further educational opportunities (see Bol & Van de Werfhorst, 2013; Pfeffer, 2015).

With regards to the second part of the first research question, we examined various types of educational signals, which enabled us to provide a more detailed picture of the impact of different types of school-leavers' signals on their labor market outcomes. Having had an apprenticeship (or a prior job) at the firm and completing a work-based VET track increases their chances of immediate entry, horizontal matching and job security. These two indicators signal more on-the-job experience and thus a higher productivity to employers. More importantly, the positive impact of apprenticeship at the firm more so indicates that network mechanisms and screening mechanisms are at work: employers are able to pre-screen the student and assess their trainability indicating whether they are fit for the job (Di Stasio & Van de Werfhorst, 2016). This seems to provide vocational school-leavers a foot in the door (see also Protsch, 2017).

Next, the observed positive impact of higher VET levels compared to the lowest VET level on youth's labor market integration indicates that, even within VET, a lower educational attainment or degree will place school-leavers in a lower rank in the job queue (Gesthuizen et al., 2010; Spence, 1973). Interestingly, it seems that school-leavers who have attained the highest level within VET (level 4) have more chances of finding a job that matches their educational level within VET (i.e. vertical matching) compared to school-leavers from lower VET levels. This finding indicates that 'closure by degrees' (Bol & Weeden, 2015) might be at work, which can explain the monopolizing position of VET level 4 occupations among VET school-leavers. In short, school-leavers with higher educational levels within VET are able to cascade down on the VET occupational ladder, whereas for school-leavers with lower attained VET levels access to occupations that require a level 4 degree, and with that certain certificates or licensure, is restricted.

Lastly, average graduation grade only increases school-leavers' chances of horizontal and vertical matching, which might indicate that grades may play a decisive role when job seekers with similar qualifications (i.e. equal field or level of education) apply for the

same job. Grades did however not increase chances of immediate entry and job security, which is in line with previous empirical findings regarding employment chances in the Netherlands (e.g. Di Stasio & Van de Werfhorst, 2016; Iannelli & Raffe, 2007).

The second research question we aimed to answer reads: *To what extent does the role of self-rated specific skills and educational signals vary between different labor market outcomes among graduated school-leavers from vocational education in the Netherlands?* Some of our results indicate that signals are indeed more impactful for immediate entry than the other labor market outcomes under investigation. However, and in contrast with our theoretical arguments, opposite or no results were also found. We shortly point out the most interesting findings. First, network mechanisms (i.e. apprenticeship training) and on-the-job experience (i.e. apprenticeship training and work-based VET track) are very important for experiencing job entry compared to horizontal and vertical matching. Second, one unexpected but explainable conclusion is that these mechanisms are as important for increasing school-leavers' chances of permanent employment as they are for chances of immediate entry. In the case of school-leavers' type of VET track, this signal seemed even more important for increasing school-leavers' chances of permanent employment rather than immediate entry. Lastly, one's educational level within VET and one's average graduation grade seem more important for increasing school-leavers' chances of finding a job within one's field (i.e. horizontal matching) rather than for immediate entry.

An important reason why we found mixed results and why it is difficult to pinpoint to what extent alternative explanations are at work is due to the fact that immediate job entry relates to school-leavers' period directly after graduation, whereas the other outcomes may relate to their situation eighteen months after graduation. Although our results did not provide entirely unambiguous answers – we think it is important for future research to explore this further, as it can provide more insights into why and how educational signals can have a different influence on different labor market outcomes. In order to examine in greater detail how the labor market integration process works from a more dynamic perspective, the first step is to make sure that the labor market outcomes cover the same period as it is quite possible that the impact of certain types of skills and signals change over the course of time. For instance, previous research found that the impact of skills on earnings can change over the life course (see Forster et al., 2016; Hanushek et al., 2017).

In addition to our contributions, we would like to point towards four improvements that can be made regarding our data and measures. First, and related to our second research question, not all indicators of labor market integration analyzed in this study pertain to the first job. Immediate job entry does, but job matching and job security have been measured at the time of the current job, one and a half year after graduation. For the period between the first and current job, it is unknown whether school-leavers shifted between employers or changed jobs within the same employers. Future research could fill

in this gap by investigating this type of information, either in prospect, retrospect or by means of a longitudinal design.

Second, our measurement of both specific and generic skills was based on self-assessed ratings of school-leavers' current level of skills, measured one and a half years after graduation. The skills pertaining to the current situation can be partly based on the skills acquired on the job (i.e. obtained after and outside vocational education). Causality can therefore for some part be reverse and needs to be interpreted with caution. We tried to interpret our findings as carefully as possible, by interpreting these skills as being acquired both in education and in the labor market, and by steering away from causal interpretations of these findings. To our knowledge, we were at least able to include a measurement of self-rated specific skills (on the micro level), by which we provide a, perhaps not perfect, step forward, and by which we aim to provide more insights on the relationship between self-rated specific skills and youth labor market integration. In future data collections, a further step would be to measure both kinds of skills exclusively related to the educational program in vocational education.

Third, even though generic skills are commonly conceptualized as having oral, written or numeracy skills in the literature (Meng, 2006; Van der Velden, 2011a) and widely tested as such by means of IALS and PIAAC, in some occupations these skills can actually for some part be defined as specific skills. Having high levels of calculating skills might for instance be a specific requirement in medical occupations where doses of medication have to be calculated. This is one of the reasons why job-specific skills are difficult to quantify. Future research can advance by performing expert interviews within occupations to determine which skills are deemed important, and to what extent they are considered generic or specific.

Fourth and last, similar to previous studies we examined VET school-leavers' overall average graduation grade (see Di Stasio & Van de Werfhorst, 2016; Protsch, 2017; Protsch & Solga, 2015). In line within the framework of queuing and signaling, higher average graduation grades indicate higher levels of trainability and perseverance to employers (Bills, 2003; Spence, 1973; Weiss, 1995). Although the type of school grades are not further specified by these theoretical frameworks, it might be interesting for future research to make a distinction between specific and generic grades as it might provide more detailed insights into the impact of both types of grades on youth labor market integration.

3.8 Conclusion

Our first contribution to the field was to simultaneously investigate the role of both self-evaluated skills and educational signals in the first eighteen months of Dutch VET school-leavers' labor market integration process. With this, our aim was to get more insight in the

extent to which different types of self-rated skills and educational signals are beneficial to youth's labor market integration.

First of all, as school-leavers evaluated their current level of skills after eighteen months after school-leaving, it is possible that we did not solely capture their self-rated skills acquired in education, but skills that may have further accumulated on the job and over that time period. For the Netherlands, a cautious interpretation of our findings is that only school-leavers' self-rated specific skills – acquired either in education or on-the-job – are positively related to the investigated labor market outcomes, and that generic skills in the first eighteen months of their integration process do not (or even negatively) affect labor market success. However, as reversed causality might play a role in our skill measurements, the role of generic skills in vocational education should not be underestimated. In fact, it should again be pointed out that generic skills are important, especially regarding VET students' opportunities to access higher levels within VET or tertiary education. Furthermore, our findings indicate that school-leavers' level of self-rated skills and (most of) the educational signals under investigation are independently of one another positively related to youth labor market integration.

Our second contribution was to investigate different types of signals and theorize how each signal can affect youth's labor market integration. Overall, the most important conclusion we draw from our empirical results is that different types of signals can increase school-leavers' labor market chances for different underlying reasons. Thus, the type of signals does matter for labor market integration (see also Di Stasio & Van de Werfhorst, 2016; Protsch & Solga, 2015). We therefore suggest future research to focus on a more extensive concept of educational signals by examining in more detail how different educational signals relate to youth labor market integration.

The third and last contribution of this study was to a priori theorize and empirically test whether and why (self-rated) skills and signals have a stronger impact on one labor market outcome compared to the other. To our knowledge, this question has remained underinvestigated in previous school-to-work research. We found that the impact of one type of signal (or skill) varies in strength between different labor market outcomes. One unambiguous conclusion we draw from our findings is that apprenticeship training and work-based tracks (i.e. network mechanisms and on-the-job experience) are more important for school-leavers' chances to experience immediate job entry and permanent employment compared to horizontal and vertical matching. As we made some first steps in investigating this question, we encourage future research to further explore this, as it may provide more nuanced insights into which signal is most impactful for which labor market outcome.

Notes

[1] Comparisons between self-rated skills and objective indicators of vocational specificity provide us more insights into the validity of school-leavers' self-perceived level of skills. The data provides information on the type of VET track and whether school-leavers have completed an apprenticeship at the firm they are currently working. We consider these two measures to be objective indicators of vocational specificity as they have influenced school-leavers' time spent on acquiring vocationally specific competencies (at the firm they are currently working). Results from bivariate correlations and multivariate linear regression models accounting for all (other) variables included in this study seem to indicate that these objective indicators of vocational specificity are slightly stronger related to higher self-perceived specific skills than self-perceived generic skills among school-leavers (Table A.1 and A.2 in Appendix A).

CHAPTER 4

The meso level:

The role of the vocational specificity of educational programs in young people's labor market integration*

* A slightly different version of this chapter has been published as:

Muja, A., Blommaert, L., Gesthuizen, M., & Wolbers, M. H. J. (2019). The vocational impact of educational programs on youth labor market integration. *Research in Social Stratification and Mobility, 64*, 100437.

4.1 Introduction

A successful transition from education to work is crucial for young people's future employment opportunities and moreover a good predictor of other adulthood transitions (Barbieri, Cutili, & Passaretta, 2016; Protsch, 2017; Scherer, 2005). Previous empirical research on school-to-work transitions reaches the general conclusion that the initial transition from school to work runs more smoothly among young people in countries with an elaborate vocational education and training (VET) system (Barbieri et al., 2016; Bol & Van de Werfhorst, 2011, 2013; Breen, 2005; De Lange et al., 2014; Levels et al., 2014; Van de Werfhorst, 2011a). Moreover, vocational qualifications appear to smoothen the transition most in a 'dual' system – a combination of school-based education and firm-based vocational learning (i.e. apprenticeships), as seen for example in German-speaking countries (Andersen & Van de Werfhorst, 2010; Iannelli & Raffe, 2007; Scherer, 2005; Wolbers, 2007a). This line of research thus indicates that the vocational specificity of educational programs is "the main mechanism through which vocational education influences [youth's] labor market outcomes" (Forster & Bol, 2018, p. 177).

Yet, these comparative studies theoretically and empirically disregard possible existing variations of the vocational specificity *between* educational programs *within* a VET system. The present study aims to provide more nuanced insights in the vocational impact on youth's labor market chances by focusing on differences between VET programs rather than between VET systems. In research on school-to-work transitions it is quite common to investigate the specificity of educational systems dichotomously (vocational vs. general) or as the share of students enrolled in vocational education (or dual) systems. This, however, treats vocational education within a country as if it is a homogeneous entity, and as if the vocational effect under investigation equally applies to the entire VET system (see also Raffe, 2014, p. 182). Furthermore, this line of research generally assumes that if a VET system is classified as highly vocationally specific, all programs within that VET system lead to highly specific skills. This is also reflected in the commonly used measurements in the literature. Following Bol et al. (2019), DiPrete et al. (2017), Forster and Bol (2018), and Vogtenhuber (2014), we argue that the specificity of educational programs is gradual and that there can be substantial heterogeneity in specificity *between* programs *within* VET education. Some vocational programs, like a car mechanic program, might indeed teach very specific occupational skills, whereas other programs, for instance marketing and communication programs, might in fact yield rather generic skills even though they are also classified as vocational programs.

To this end, our first research question reads: *To what extent does the vocational specificity of educational programs in VET promote school-leavers' labor market integration?* Or stated differently, do school-leavers from more specific programs in VET experience better labor market outcomes than school-leavers from less specific programs in VET? Four common indicators of youth labor market integration are examined: having a paid job, immediate

job entry after graduation, and experiencing a horizontal job match (i.e. matching to the field of education) or a vertical job match (i.e. matching to the level of education). We investigate our research question within the context of the VET system in the Netherlands ('MBO' in Dutch), which lends itself well for the purpose of our study because it is characterized by a high degree of heterogeneity, as is more often the case in highly stratified and vocationally specific educational contexts (Vogtenhuber, 2014).

We attempt to open the black box of within-country heterogeneity in the vocational impact of educational programs on youth's labor market integration in three important ways. First, we provide a different approach compared to the "linkage approach" that has already improved current understandings by moving beyond that dichotomous divide. A growing body of literature applies the linkage approach, which measures the vocational specificity of educational qualifications through the observed number of occupational positions an educational program is linked to (e.g. Bol et al., 2019; DiPrete et al., 2017; Forster & Bol, 2018; Vogtenhuber, 2014). Unique to this study are two measurements of the vocational specificity of educational programs, obtained through assessments by professionals involved in the programs (e.g. teachers, managers, and education coordinators). Unlike the linkage approach, our measurements target the curricular design and content of the educational program. Through these assessments, we determine the vocational specificity based on various characteristics of the (curriculum of the) educational program itself, which is a unique approach to investigate the vocational impact of programs.

Moreover, we examine the vocational impact over and above the influence of other important educational observables (e.g. educational level within VET, and average graduation grade) and individual characteristics (e.g. self-rated specific and generic skills, and parental educational background). Previous research has encouraged future studies to better control for factors both related to school-leavers' educational decisions and their labor market outcomes, as they were only able to do so to a limited extent (see Forster & Bol, 2018, p. 189; Vogtenhuber, 2014, p. 380). By taking these confounding factors into account, we thus aim to provide a closer investigation of the vocational impact of educational programs.

Second, by focusing on differences in youth's labor market outcomes between educational programs this study tests well-known theories of queuing and networks. Although these micro theories have frequently been tested in comparative research in which the micro-mechanisms are applied to explain possible macro level (or cross-national) differences (see Raffe, 2014), it is of dire interest to test these mechanisms on the level in which they are primarily expected to operate. Up to now, surprisingly little is known about the extent to which these well-established theories might explain possible differences in youth labor market integration between educational programs. Because of the more direct conceptualization and measurement of the vocational specificity of educational programs we use, we provide more direct tests of these theories than similar prior studies

(e.g. Forster & Bol, 2018; Vogtenhuber, 2014). Previously, vignette studies on employers' hiring behavior have tested the impact of these actual micro mechanisms on labor market chances quite directly and adequately (e.g. Di Stasio & Van de Werfhorst, 2016; Protsch & Solga, 2015), but these were naturally more focused on differences (in educational and individual characteristics) between job seekers and not so much on differences between educational programs.

Third, so far little is known to what extent macro-economic conditions influence the relationship between the specificity of educational programs and youth's integration into the labor market. A negative aspect of vocationally specific programs is that they might limit mobility across occupations (e.g. Coenen et al., 2015; Korpi et al., 2003). Thus, when demand is low, school-leavers from these programs may be exposed to higher risks of unemployment and downward mobility (Protsch & Solga, 2016). In other words, the positive impact of vocationally specific programs might actually turn into a penalty when, for instance, regional unemployment rates are high. Given that educational qualifications are more binding in tightly regulated and highly segmented labor markets (Scherer, 2004), it would be particularly interesting to examine this within such a context, as is the case in the Netherlands. Our second research question therefore reads: *To what extent do regional unemployment rates influence the positive impact of the vocational specificity of educational programs in VET on school-leavers' labor market integration?*

4.2 Theory

With respect to our first research question, we draw on two theoretical approaches to explain possible within-country heterogeneity of the vocational impact of VET programs. We consider queuing and network mechanisms as explanations for the following supposition: more specific programs provide a smoother transition into the labor market for school-leavers than less specific programs. These two mechanisms are known to be very hard to disentangle empirically (see Bills, 2003; Di Stasio & Van de Werfhorst, 2016; Van de Werfhorst, 2011a) and this study is no exception. We therefore discuss both theoretical approaches and their assumptions about which underlying mechanisms and processes drive the vocational impact, before formulating our hypotheses.

We can distinguish and take into account the role of school-leavers' human capital (Becker, 1964), as it concerns individuals' level of skills that can to some extent be observed by employers. The two other mechanisms run through program characteristics, as they concern either signals sent through educational qualifications or networks that exist between schools or graduates and employers. Thus, to rule out that program effects are not in fact effects of one's acquired skills, school-leavers' levels of self-rated job-specific and generic skills (discussed in data below) are taken into account.

4.2.1 Signaling

The *queuing* approach refers to a cluster of theories explaining *why* education increases youth's labor market chances, which argues that job-seekers use education to send *signals* to employers (Spence, 1973), whereas employers use education as a screening device (Arrow, 1973) that provides information about job-seekers' trainability, productive capacity and other unobserved qualities, for instance commitment and motivation. In addition, Thurow (1975) emphasizes that employers use signals to screen for applicants that require the least (additional) training costs. This screening process based on educational signals is a cheap and therefore commonly adopted method for employers to obtain more information about applicants, when direct information about their actual level of skills is limited. The latter is especially the case with regard to new labor market entrants that have no prior employment experience nor references from previous employers (Brzinsky-Fay, 2017, p. 348). Importantly, it depends strongly on the educational and labor market context whether educational qualifications send clear and informative signals.

In the Netherlands, the educational system is highly stratified and standardized, and VET ('MBO' in Dutch) is in general highly vocationally oriented with strong linkages to the labor market (Iannelli & Raffe, 2007; Raffe, 2008; Van der Velden & Wolbers, 2007). Because of this high level of educational tracking (i.e. stratification) and highly standardized educational input (i.e. what is taught) and output (i.e. qualifications obtained against external, nationwide standards), educational qualifications in this context signal clear and reliable information to employers about job-seekers' level of skills and potential productivity (Bol & Van de Werfhorst, 2011; Levels et al., 2014, Scherer, 2005). The more valid the signals of educational credentials are in conveying information about the real qualifications and skills of school-leavers, the more weight is given to them during recruitment processes (Scherer, 2005, p. 429). Thus, in the Dutch educational system, these institutional features allow employers to more strongly rely on signals sent by educational qualifications, compared to more weakly stratified and generalist educational systems, such as the UK (see also Di Stasio & Van de Werfhorst, 2016, p. 81).

Furthermore, the strong vocational specificity of Dutch VET equips students with a strong occupational specialization for jobs that are related to their educational program. Hence, the more vocationally specific a program is, the clearer and more informative the signals sent to employers about school-leavers' level of occupation-specific skills and potential productivity (Bol & Van de Werfhorst, 2011, p. 122; Breen, 2005, p. 126).

Finally, active involvement of employers in the curricular design of educational programs increases the signaling power of educational qualifications (Breen, 2005; p. 126; Iannelli & Raffe, 2007, p. 50). These two features – i.e. vocational specificity and institutional linkage – are less distinct than they appear to be, as argued by Breen (2005, p. 126). Programs that are more closely linked to the labor market ensure that the skills taught in educational

curricula not only closely reflect skills that are actually in demand by employers (Levels et al., 2014), but employers also have "more direct knowledge of the programs and of the students they recruit" (Iannelli & Raffe, 2007, p. 50). This naturally increases the clarity and credibility of the information sent through signals and employers' confidence to rely on it (Di Stasio & Van de Werfhorst, 2016; Iannelli & Raffe, 2007; Raffe, 2008). Because programs with more vocationally specific curricula tend to be more strongly embedded in an institutional relationship with the labor market, this can be expected to apply more strongly to more specific programs within VET.

From this, it follows that more specific educational programs send more informative and clear signals to employers about job seekers' immediate productivity on entry and potential future productivity than less specific programs (Bol & Van de Werfhorst, 2011; Breen, 2005; Iannelli & Raffe, 2007; Vogtenhuber, 2014). We therefore expect that more specific programs increase school-leavers' chances of being allocated to a paid job and experience a faster entry into the labor market (Scherer, 2005; Wolbers, 2003, 2007a). Likewise, we expect more specific programs to increase chances for school-leavers to find a job that matches their field and level of education (i.e. horizontal and vertical matching). The specific vocational qualifications increase the amount of information available for employers, helping them to successfully allocate school-leavers to jobs that match their skills (Levels et al., 2014). Generally, the better informed employers are, the lower the chances that job mismatches occur, as they most often occur under imperfect information conditions (Breen, 2005; Levels et al., 2014; Scherer, 2004, 2005; Vogtenhuber, 2014).

4.2.2 Network mechanisms

Next to signaling, *network mechanisms* may also play an important role through the vocational specificity and institutional linkages of educational programs. Network theories (Rosenbaum et al., 1990) suggest that students might capitalize on contact with employers by making use of the information and influence employers have (i.e. social capital). Through contact between programs and students on the one hand and employers on the other hand, employers may allocate school-leavers to jobs in their own firms, offer school-leavers help in finding a job, or help them being allocated to jobs. This can increase school-leavers' chances to enter a job more quickly after successful completion of the attended program (Breen, 2005; Iannelli & Raffe, 2007). We expect that school-leavers from more specific programs are better able to establish contact with employers and therefore benefit more from it, because more specific programs have more and better ties with employers (i.e. closer linkages).

Next, networks can also facilitate students' chances to find a matching job at the end of their training program (Levels et al., 2014, p. 345; Scherer, 2005). School-leavers from more specific programs may obtain more and better information via employers about available jobs and this would in turn improve their chances of finding a better suited job (i.e. one

that matches their level and field of education more closely). Conversely, programs and school-leavers with fewer and less strong ties to employers may have to do with less information and school-leavers from these programs may therefore be more likely to end up accepting jobs that are less fitting for their educational level and field.

Moreover, employers may favor those applicants that have a pre-existing relationship with the firm (Di Stasio & Van de Werfhorst, 2016; Levels et al., 2014). One reason for this preference is that employers are able to prescreen their actual level of (job-specific) skills and productivity, and assess firsthand whether they are fit for the job (Di Stasio & Van de Werfhorst, 2016). Another reason is that employers have already invested time in their training in order to improve their firm-specific human capital and productivity. This preference may thus increase school-leavers' chances to continue to work within firms where they completed their workplace training (Levels et al., 2014; Protsch, 2017; Rosenbaum et al., 1990), which in turn increases their chances of having a paid job, experiencing immediate entry, and a matching job.

To summarize, because of clearer signals of productivity and more possible future employers in their social network, school-leavers from more specific educational programs in VET experience better labor market opportunities than those from less specific programs. Therefore, our first hypothesis reads as follows:

The more vocationally specific the educational program a school-leaver successfully attended, the higher the likelihood of having a paid job (H1a), experiencing immediate job entry (H1b), and horizontal (H1c) and vertical (H1d) job matching.

4.2.3 Vocational impact under adverse macro-economic conditions

Moving on to our second research question, which asks whether the impact of the vocational specificity of educational programs on youth labor market integration may depend on and vary with macro-economic conditions. In highly specific programs, the acquisition of specific skills provides students with a strong specialization for and optimal preparation in a particular field of occupation, which is appealing for both students and employers (Hanushek et al., 2017). We have argued how more specific programs may lead to increased labor market chances. However, one could also argue that stronger occupational specialization in educational programs might turn into a disadvantage when aggregate unemployment rates are high and labor market demands low. Under such circumstances, school-leavers from specific (or specialized) educational programs may prove to be less flexible on the labor market compared to those from more general programs (Borghans & De Grip, 2000; Hanushek et al., 2017). While school-leavers from specific programs have acquired occupationally specific skills that are applicable in a small(er) subset of occupations, their counterparts from less specific programs have acquired skills that are more applicable in a wider set of occupations (Borghans & De

Grip, 2000; Coenen et al., 2015; Hanushek et al., 2017). Consequently, and given the fact that VET school-leavers are generally oriented towards the local labor market, it can be assumed that when regional unemployment rates are high, recent graduates from more specific programs can less easily divert to other occupations compared to those from less specific programs (Coenen et al., 2015; Korpi et al., 2003; Reimer et al., 2008). Thus, school-leavers from more specialized programs might less quickly find employment or (at least) jobs that match their level and field of education compared to school-leavers from less specific programs, especially when first entering the labor market. In other words, specific programs may be more advantageous in regions with lower unemployment rates. Our second hypothesis therefore reads:

The positive effect of the vocational specificity of the educational program a school-leaver successfully attended on the likelihood of having a paid job (H2a), experiencing immediate job entry (H2b), and horizontal (H2c) and vertical job matching (H2d) is smaller when the regional unemployment rate is higher.

4.3 Data

4.3.1 Data of VET school-leavers

We empirically test our hypotheses with cross-sectional data from the annual VET survey ('BVE monitor' in Dutch) conducted in the Netherlands by the Research Centre for Education and the Labor Market (ROA) of Maastricht University, collected in the period 2011–2015. The main aim of the survey is to provide insight into the transition from school to work (or continuous education) among graduated school-leavers from upper secondary VET in the Netherlands. For this reason, they are questioned one and a half years after school-leaving by means of either the written or online version of the questionnaire. The survey collects both retrospective information about school-leavers' educational career and information about their educational and labor market activities at the time of the survey. An advantage of using data on recent graduates is that their labor market outcomes are more directly affected by their education (Van de Werfhorst, 2011b).

The main focus of our study is to analyze the initial school-to-work transition among recently graduated school-leavers from upper secondary VET. Because of this, we are only interested in school-leavers who, at the time of the survey, were between the ages of 16 and 27, did no longer study, had not obtained an additional (higher) degree, and were not self-employed or working freelance. Moreover, we focus on school-leavers from VET levels 2, 3, and 4, thereby excluding VET levels 1 and 4+ (specialist training), because only the diplomas of the selected VET levels are in accordance with the classification that is internationally equal to upper secondary VET. The classification we used is the widely applied International Standard Classification of Education (ISCED), with ISCED level 3

being equal to upper secondary VET. Finally, we only wanted to examine educational programs with 15 or more school-leavers (n = 225 programs) in order to have sufficient variation within the programs. The data sample relevant for our study therefore consisted out of 21,212 school-leavers.

4.3.2 Data of VET experts involved in educational programs

We enriched the individual school-leaver data with two measurements referring to the vocational specificity of educational programs. We obtained this information from a survey held among experts involved in VET programs. We will refer to this survey as the VET expert survey (called the 'CGO-monitor' in Dutch). This nationwide expert survey is held with the aim of measuring objectives of competency based Dutch VET as formulated by the Dutch Ministry of Education, such as the focus on vocational and generic competencies within programs (Van der Meijden, Van den Berg, & Román, 2013), and was conducted by the Dutch Centre for Expertise in Vocational Education and Training ('ecbo' in Dutch). We use expert data from 2011 (the most recently collected wave of this survey), but because the Netherlands has a highly standardized educational system (Van der Velden & Wolbers, 2007) and no major changes took place in the VET-curricula between 2011 and 2015, this information can be assumed to form an accurate reflection of programs' features for the entire period under study.

The questionnaire was directed at contact persons (coordinators) of educational programs of publicly funded VET institutions in the Netherlands (the response rate was 48 percent). Respondents had to have one of the following positions within educational programs: coordinator, teacher, or manager. They often had overlapping functions (e.g. being a teacher and a team coordinator). Some of the respondents were involved in more than one training program, but they had to fill out the web-based survey for the program for which they were most involved with (i.e. for which they were employed the most hours per week).

The expert sample consists of a total of 947 professionals. However, some of these professionals were part of VET programs that were not involved in the 225 selected programs in the VET data. Vice versa, not all 225 programs from the school-leaver data were represented in the expert data. The mismatch between both datasets led to a reduction of a total of 119 programs. The expert data for these programs consisted of 380 professionals. Based on their assessments, we conducted a measure for the vocational specificity of the programs. However, due to missing values on this measurement (2.2 percent), a total of 114 programs among 15,912 school-leavers remained in our final, analytical sample. Although we lost some cases while combining these two datasets, it gives us the unique opportunity to analyze the impact of the vocational specificity of educational programs in VET on school-leavers' labor market chances.

4.3.3 Regional unemployment data

Lastly, we also enriched the school-leaver data with information on yearly regional youth unemployment rates we obtained from Statistics Netherlands (2018b). The Netherlands can be divided into 40 regional areas, also known as COROP regions. One relatively small regional area ("Delfzijl and area") had few respondents, so we combined it with the neighboring area ("remainder of Groningen"), which ultimately resulted in 39 COROP areas. More information about the specific operationalization follows below.

4.4 Measurements

4.4.1 Labor market outcomes

Having a paid job at the time of the survey was measured with the question: "Do you have a paid job at this moment?". Respondents could answer with yes (1) or no (0). As indicated above, the analytical sample consisted of 15,912 school-leavers and we refer to this sample as the 'total sample' because it includes both employed and unemployed individuals.

The remaining three labor market outcomes – immediate labor market entry[1], and horizontal and vertical job matching – were solely measured for employed individuals (14,091 school-leavers out of the total sample). *Immediate labor market entry after graduation* was measured using the question whether (1) or not (0) the respondent was employed after finishing VET. *Horizontal job matching* was measured by asking respondents whether (1) or not (0) their own or a related field of study was required for their current job. *Vertical job matching* was measured in a similar way and indicates whether (1) or not (0) school-leavers have a current job that matches their own level of education. After excluding cases with missing values on these dependent variables, the sample was reduced to 13,243 respondents. For convenience, we will call this sample the 'employed sample'.

4.4.2 Regional unemployment rate

As mentioned earlier, we obtained information on yearly regional youth unemployment rates among all 15- to 27-year-olds from Statistics Netherlands (2018b). These regional rates were linked to the regional location of respondents' schools. In 67.1 percent of the cases, the regional location of the school was also the region where school-leavers lived. As a robustness check, we also ran the final models with the region of respondents' place of residence during their last year of the program. These results are similar to the results presented in this study and are available upon request.

Furthermore, the rates were averaged over the five sampling years and then standardized. Overall, the differences in rates between our sampling years are not big. For only three

of the 39 regions these rates differed strongly between years (6-7-percentage point). We conducted additional analyses with yearly unemployment rates, which we discuss below (see 'Sensitivity Analyses'). Due to missing information on the regional location of the school for some respondents some cases had to be excluded (0.1 percent in both samples). Figure 4.1 depicts the pre-standardized distribution of the averaged regional youth unemployment rates, ranging from 17 to 34 percent[2].

4.4.3 Program characteristics

First, the *vocational specificity of educational programs* in terms of *amount of vocational skills and knowledge* was measured in the VET expert survey among professionals (e.g. teachers, managers, education coordinators) involved in VET programs. The following six items were used to measure the degree to which a program is vocationally specific (on a 5-point Likert response scale, ranging from very inadequate (1) to more than sufficient (5)): "To what extent do you think the educational program trains students to become qualified trades workers?" "To what extent do students in your program develop vocational knowledge?", "To what extent do students in your program develop vocational skills?", "To what extent do students in your program develop a professional attitude?", and "To what extent do students in your program develop competencies to carry out core tasks of the profession?". We averaged the scores and created a standardized scale (Cronbach's alpha = 0.89). Figure 4.2 presents the pre-standardized distribution, showing considerable variation (around 33 percent) between programs on this scale.

Second, VET professionals also answered the following question related to the *vocational specificity of educational programs* in terms of *apprenticeship training (on-the-job experience)*: "What is (approximately) the total percentage of time spent in apprenticeships training at firms during the entire program?". The scores were subsequently standardized. Naturally, this measure is closely linked to attending either a work-based or school-based VET track (Pearson's $r = 0.798$, $p = 0.001$) in the Netherlands. The advantage of this measure compared to the work-based versus school-based track measure is that it also captures possible variation within these types of tracks, thus providing additional information beyond the dichotomy. Figure 4.3 presents the pre-standardized distribution of this scale, which depicts even more variation (around 60 percent) between programs on this measurement.

We conducted interrater reliability tests for both vocational measures, which showed a strong agreement (with a reliability of ICC(2,2) = 0.730 and ICC(2,2) = 0.819 respectively) among pairs of professionals rating the same program within the same location[3]. Again, because of the highly standardized Dutch educational system (e.g. Iannelli & Raffe, 2007; Van der Velden & Wolbers, 2007), we expect little variation between locations. The scores were thus aggregated to the level of educational programs and merged with the corresponding programs in the data from the VET survey. The two vocational measures are not strongly correlated (Pearson's $r = 0.135$, $p = 0.152$).

Returning to the VET survey, VET level was measured in three categories: "basic vocational training, level 2", "vocational training, level 3", and "management training, level 4". We included an additional category for the missing values on this measurement. Next, *educational sector* was comprised of five categories: "economics", "technology", "agriculture", "health care", and "social work/welfare". All dummies were aggregated to the program level.

4.4.4 Individual control variables

Respondents were asked if they were male (0) or *female* (1). *Age* was measured in years and standardized. A variable capturing *migration background* indicates whether at least one of the respondent's parents was born in a western or non-western foreign country, which is in accordance with Statistics Netherlands' definition (2018a). Three categories were created based on this definition: "native Dutch", "western migration background", and "non-western migration background". The number of cases with missing values was small. Therefore, these cases were excluded from the samples (in both samples 0.6 percent). *Parental educational background* was measured in three categories: "lower education" (primary and lower secondary education), "intermediate education" (upper secondary general and vocational education), and "higher education" (tertiary education). A separate category was included for cases that had missing information on one or both of the parents. *Year of graduation* was determined by means of register data (ROA). The data include graduation years 2010 to 2014, each of which was represented by a dummy variable.

Average graduation grade was measured by asking respondents what their total average graduation grade was, which ranged from "6.0" (minimum grade to pass exams) to "8.5 or higher". Scores on this item were standardized. Cases with missing values were deleted in the total (1.4 percent) and employed (1.2 percent) sample.

Both *specific* and *generic skills* were measured using a self-reporting approach in which respondents were asked to indicate their own level of skills (on a 5-point Likert scale, ranging from mediocre (1) to excellent (5)). The average score of the items "vocational knowledge" and "the ability to apply vocational knowledge and techniques in practice" was calculated to construct a measure of *specific skills* (Cronbach's alpha = 0.643). Next, we constructed a measure for generic skills by averaging the scores on the following three items: written, oral, and numeracy skills (Cronbach's alpha = 0.607), which is in accordance with measures of previous research (e.g. Meng, 2006). These three components of generic skills are internationally measured this way, by means of widely used assessments such as the International Adult Literacy Survey (IALS) and the Programme for the International Assessment of Adult Competencies (PIAAC), both conducted by the OECD. Both skills measures were standardized, in which a higher score indicates a higher level of skill. Cases with missing values on specific (10.2 percent) and generic skills (9.1 percent) were deleted in

the employed sample. Table 4.1 presents the descriptive statistics of all (pre-standardized) variables in the total and employed sample.

4.5 Analytical strategy

Since school-leavers are nested within regions (where the schools are located) and educational programs, and the labor market outcomes are all binary, the data were analyzed using logistic multilevel regression models. More specifically, the multilevel models included three levels: the individual level, the regional level (region of attended school), and the program level.

We chose for a hierarchical structure with educational programs as the highest level for two reasons. First and foremost, our main interest is whether the vocational impact differs between educational programs. This structure gives us the opportunity to assess systematic differences between programs. Next, given the high standardization in the Dutch educational system (Di Stasio & Van de Werfhorst, 2016; Iannelli & Raffe, 2007), we argue that there is little variation within the same educational programs offered across different schools located in different regional areas. For example, a car mechanic program in region A is not that different from the car mechanic program in region B. The type of educational program attended is thus considered to be more important than the particular region or the attended school (Van der Velden & Wolbers, 2007).

4.6 Sensitivity analysis

To gauge the sensitivity of our results to the chosen hierarchical three-level model, we conducted three additional analyses. First, cross-classified models were conducted, in which regions and educational programs were not hierarchically nested but both were considered level 2 contexts. The main results from the cross-classified models (see Table B.1 and B.2 in Appendix B) did not substantially differ from the results of our main analyses. Second, analyses were conducted in which the impact of *yearly* regional unemployment rates was examined (see Table B.1 and B.3). Lastly, we ran two-level models with programs as the highest level (see Table B.4). We did this because of the very low variance (highest = 0.092) and ICC (highest = 0.027) at the region level, which we discuss more elaborately in the next section. Overall, the findings from the sensitivity models did not differ substantially from our main models.

Table 4.1 | Descriptive statistics of all (pre-standardized) variables for both samples.

			Total sample (N = 15,571)		Employed sample (N = 11,678)	
	Min	Max	Mean	SD	Mean	SD
Paid job	0	1	0.89	0.32		
Immediate entry	0	1			0.80	0.40
Horizontal job match	0	1			0.70	0.46
Vertical job match	0	1			0.74	0.44
Program level						
Vocational specificity: skills and knowledge	2.17	5.00	4.30	0.36	4.31	0.36
Vocational specificity: apprenticeship training	8.00	100	43.85	14.28	44.12	14.37
VET level						
Level 2 (= ref.)	0	1	0.16	0.37	0.13	0.34
Level 3	0	1	0.28	0.45	0.28	0.45
Level 4	0	1	0.56	0.50	0.59	0.49
Educational sector						
Economics (= ref.)	0	1	0.32	0.47	0.30	0.46
Agriculture	0	1	0.02	0.13	0.02	0.13
Technology	0	1	0.18	0.38	0.18	0.38
Health	0	1	0.28	0.45	0.30	0.46
Social work	0	1	0.20	0.40	0.20	0.40
Region level						
Regional youth unemployment rate	17.19	34.74	24.39	4.55	24.24	4.51
Individual level						
Female (male = ref.)	0	1	0.69	0.46	0.69	0.46
Age	16	27	21.85	1.78	21.83	1.75
Migration background						
Native Dutch (= ref.)	0	1	0.86	0.35	0.89	0.32
Western migration background	0	1	0.05	0.21	0.04	0.20
Non-western migration background	0	1	0.10	0.30	0.07	0.26
Parents' education						
Lower educated (= ref.)	0	1	0.21	0.41	0.22	0.41
Intermediate educated	0	1	0.40	0.49	0.45	0.50
Higher educated	0	1	0.25	0.43	0.27	0.45
Parental missing	0	1	0.14	0.34	0.06	0.24
Year of graduation						
2010 (= ref.)	0	1	0.08	0.27	0.09	0.28
2011	0	1	0.07	0.25	0.07	0.26
2012	0	1	0.40	0.49	0.40	0.49
2013	0	1	0.07	0.26	0.07	0.26
2014	0	1	0.38	0.48	0.37	0.48
Average graduation grade	6.00	8.50	7.33	0.53	7.35	0.53
Specific skills	1	5			3.88	0.64
Generic skills	1	5			3.77	0.66

Source: VET survey 2011-2015 and VET expert survey 2011.

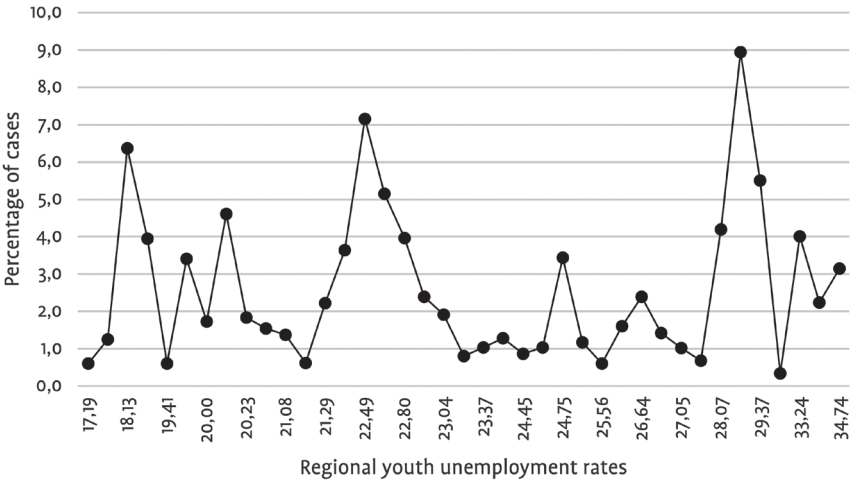

Figure 4.1 | Percentage of cases per regional youth unemployment rate in the sample.

Source: VET survey 2011-2015 and VET expert survey 2011; $N_{individuals}$= 15,571.

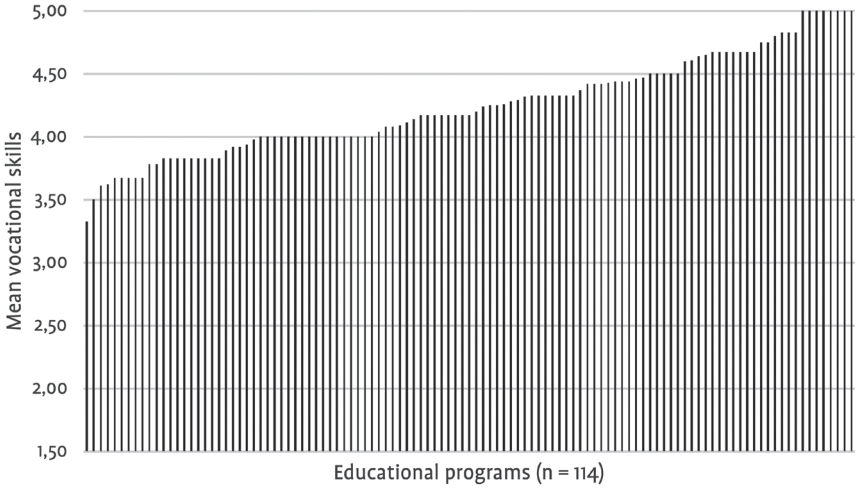

Figure 4.2 | The mean skill vocational specificity of each VET program.

Source: VET survey 2011-2015 and VET expert survey 2011; $N_{programs}$ = 114.

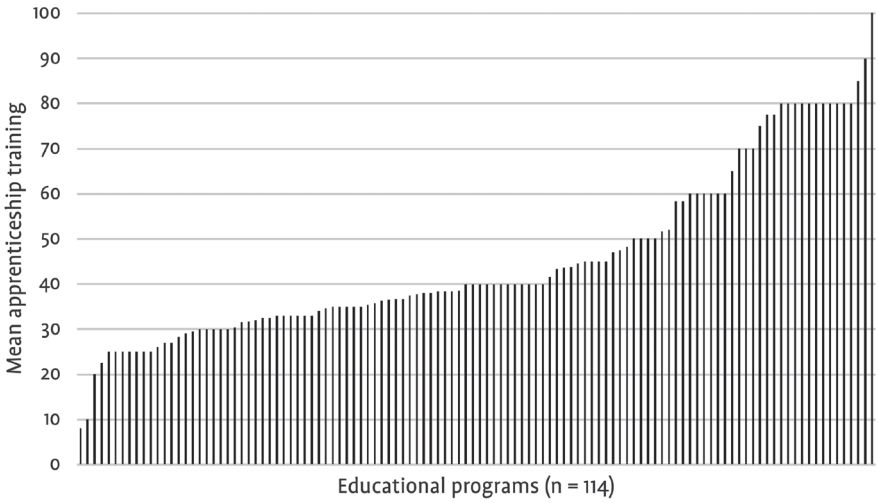

Figure 4.3 | The mean apprentice vocational specificity of each VET program.

Source: VET survey 2011-2015 and VET expert survey 2011; $N_{programs}$ = 114.

4.7 Results

4.7.1 Null models of logistic multilevel analyses

To test the extent to which school-leavers' labor market outcomes are explained by differences between educational programs, regions and individuals, we start by estimating null models and corresponding intraclass correlations (ICC's) of the three-level logistic regression analyses presented in Table 4.2. As expected, school-leavers' labor market chances vary between programs. Of the observed variation in young people's chances of having a paid job, experiencing immediate entry, and horizontal and vertical job matching, 15.2, 11.5, 27.6, and 16.4 percent, respectively, is explained by differences between programs. In order to examine the vocational impact of programs on school-leavers' labor market chances, we turn to the results of our full models.

Surprisingly, we find very low intra-class correlations on the region level for every labor market outcome. This indicates that only 2.7, 0.3, 2.0, and 0.8 percent, respectively, of the variation in school-leavers' chances of having a paid job, experiencing immediate job entry, and a horizontal and vertical job match is explained by differences between regions. These findings thus indicate that youth's labor market chances are explained only to a very limited extent by regional differences, and vary more between educational programs than between regions. Nevertheless, we run the three-level models in order to examine the impact of the regional unemployment rates on youth's labor market chances.

Table 4.2 | Results of logistic 3-level analyses: logit effects, variance and ICC's of the null models (logit effects).

	Total sample			**Employed sample**								
	Paid job			Immediate entry			Horizontal match			Vertical match		
	b	(SE)	ICC	b	(SE)	ICC	b	(SE)	ICC	b	(SE)	ICC
Intercept	2.203***	(0.085)		1.361***	(0.071)		0.812***	(0.111)		0.963***	0.083	
Variance components												
Program level 3	0.590	(0.768)	0.152	0.423	(0.650)	0.115	1.251	(1.119)	0.276	0.648	(0.805)	0.164
Region level 2	0.092	(0.303)	0.027	0.009	(0.092)	0.003	0.067	(0.258)	0.020	0.027	(0.163)	0.008
N programs	114			114			114			114		
N regions	2,478			2,260			2,260			2,260		
N individuals	15,571			11,678			11,678			11,678		
Log-likelihood	-5,255.7			-5,673			-5,846.9			-5,797.3		

*Source: VET survey (2011-2015) and VET expert survey (2011). ***p <0.001 (two-tailed).*

4.7.2 Main results logistic multilevel models

Tables 4.3, 4.4 and 4.5 report findings from our hierarchical logistic three-level models. All models control for gender, age, migration background, parental educational background, year of graduation, average graduation grade, specific and generic skills (only in the employed sample), educational sector, and educational level. Main effects are shown in Table 4.3, whereas the statistical interaction terms of the vocational specificity measures with the regional unemployment rates are presented in Tables 4.4 and 4.5.

Based on the models presented in Table 4.3, we test whether the vocational specificity of educational programs has a positive impact on youth's labor market chances. We find a significant positive vocational impact in terms of the amount of *apprenticeship training* within programs on school-leavers' labor market chances, which is in line with our first hypothesis (H1a, H1b, H1c and H1d). Both network mechanisms (Rosenbaum et al., 1990) and signaling mechanisms (Spence, 1973) may drive these effects.

First, these positive effects can be explained by the stronger involvement of employers in the program and more apprenticeship training, which both increase the possibility of *contact* between students and employers (i.e. network mechanisms), increasing students' chances to enter a job more quickly after successful completion of the attended educational program and being allocated to a matching job (Iannelli & Raffe, 2007; Levels et al., 2014; Scherer, 2005). Apprenticeships can even lead to direct contact with possible future employers and their network. In our sample, around 35.6 percent of the school-leavers were previously an apprentice at their current job and 11.4 percent had previously been an employee at their current firm (total of 47 percent). Thus, apprenticeships seem to strongly promote school-leavers' labor market chances, because they can often continue to work with the same employers who provided the training (Di Stasio & Van de Werfhorst, 2016).

Second, stronger involvement and more apprenticeship training both also increase the *signaling power* of educational qualifications (Breen, 2005; Iannelli & Raffe, 2007). A stronger involvement of employers in the curricular design of the programs ensures that the skills taught are not only attuned to their requirements (Levels et al., 2014), but also that they have more direct knowledge of the programs and the students they recruit (Iannelli & Raffe, 2007). As a result, clearer and more credible signals are sent to employers about school-leavers' (potential) productivity (Di Stasio & Van de Werfhorst, 2016; Raffe, 2008). Additionally, apprenticeship experiences can be easily quantified and put on resumes, signaling school-leavers' exact amount of on-the-job experience, which provides easy-to-observe information about school-leavers' level of labor productivity (Protsch, 2017). Hence, both mechanisms may play a role in explaining why more vocationally specific programs increase young people's labor market chances, but we cannot pinpoint empirically the exact contributions of both mechanisms.

Next, in models in which we separately included both vocational measurements (Table B.5 in Appendix B), the vocational impact in terms of amount of *vocational skills and knowledge* within programs has a significant positive effect on immediate entry, horizontal matching, and vertical matching (borderline). However, when the 'apprenticeship vocational measurement' is added to the models, only the effects of programs' amount of vocational skills and knowledge on school-leavers' chances of immediate entry (borderline) and a horizontal job match remains significant (see Table 4.3). Young people's likelihood of having a paid job eighteen months after graduation does not seem to be related to the specificity of educational programs measured as such. To facilitate the comparison of the estimates we also ran the linear probability models (Table B.6 in Appendix B). These findings are similar to our main three-level logistic models.

All in all, these findings seem to indicate that more vocationally specific programs improve youth's chances in the labor market and that this applies more strongly to the measure of vocational specificity focusing on the apprenticeship component of programs than to the measure focusing on the job-specific skills and knowledge component of programs. An explanation for this might be that even if a program is strongly oriented towards providing students with vocational knowledge and skills, this information may not be that clear of a *signal* for employers, especially those who are not directly involved in the program (e.g. assessing and co-designing curricula). By contrast, the amount of apprenticeship training of programs can still be a clear and objective signal for employers, even if they are not involved in assessing or co-designing programs. Another possible explanation for this pattern of results is that the more positive impact of apprenticeship training is explained by the fact that network mechanisms are important drivers of the observed effects.

4.7.3 Findings of control variables

Regarding our control variables in Table 3.3, we found that the older school-leavers are, the less likely they have a paid job or experience immediate entry after graduation. Next, school-leavers with a non-western migration background have lower labor market chances on all outcomes than their native Dutch counterparts, while school-leavers with a western migration background have lower labor market chances of having a paid and vertical matching job. School-leavers with middle or higher educated parents have higher chances of having a vertical matching job than school-leavers with lower educated parents. Interestingly, school-leavers with higher educated parents have lower chances (borderline significant) of immediate job entry after graduation compared to school-leavers with lower educated parents. A reason for this might be that they are in a lesser hurry (financially) to immediately enter the labor market.

Next, a higher graduation grade increases all school-leavers' labor market chances. A higher level of job-specific skills increases school-leavers' chances of immediate entry, and horizontal and vertical matching, whereas higher levels of generic skills decreases

these chances. One's graduation year also seems to affect labor market chances. School-leavers graduated in the period from 2012 to 2014 have lower chances of a paid job, immediate entry (only to 2013), and horizontal and vertical matching compared school-leavers graduated in 2015.

Finally, we found interesting results regarding the impact of the program characteristics. Compared to school-leavers from VET level 2, school-leavers from level 4 have a higher chance of finding a vertical matching job. Moreover, school-leavers from both level 3 and 4 have higher chances of a paid job, immediate entry, and horizontal matching. Finally, school-leavers from the healthcare sector have better labor market chances on all outcomes than those from the economics sector. School-leavers from the technology sector also have better chances of finding a paid job than school-leavers from economics.

4.7.4 Results of the moderating role of regional youth unemployment rates

Our second hypothesis argues that the positive vocational impact of educational programs on youth's labor market opportunities is weaker in regions where unemployment rates are higher. Starting with the main effects in Table 4.3, we find that the higher the regional unemployment rate is, the less likely school-leavers to have a paid job and to have experienced immediate entry (borderline significant) after leaving school, which is in line with findings from previous (country-national) studies (e.g. Scherer, 2005; Wolbers, 2007a). Turning to the statistical interactions reported in Tables 4.4 and 4.5, we do not find a significantly weakening vocational impact on youth's labor market chances due to higher regional unemployment rates. Hence, no support for H2 is found.

We illustrate these interaction effects in Figure 4.4, which shows the estimated coefficients of the vocational specificity measure (depicted on the y-axis) conditional on the values of the regional unemployment rate (x-axis). The overall pattern is that the impact of both vocational specificity measures changes very slightly or not at all as regional youth unemployment rates increase. Additionally, Figure 4.5 depicts the average marginal effects of the vocational specificity of programs (x-axis) on the labor market outcomes (average predicted values on the y-axis) by regional youth unemployment rates. In order to provide clearer graphs, the regional youth unemployment rates are divided into low versus high regional youth unemployment rates (the lower and upper half of the distribution). Again, we see that both measures of the vocational impact do not differ substantially between low versus high regional unemployment rates. To conclude, all graphs support our prior conclusion that the vocational impact does not depend on or vary significantly with regional youth unemployment rates. Thus, our findings indicate that the otherwise positive vocational impact does not turn into a penalty in regions where the youth unemployment rate are higher, at least not within the Dutch VET context.

Table 4.3 | Results of main effects logistic 3-level models of school-leavers' labor market chances (logit effects).

	Total Sample		Employed sample					
	Paid job		Immediate entry		Horizontal match		Vertical match	
	b	(SE)	b	(SE)	b	(SE)	b	(SE)
Program level								
Skill vocational specificity	0.027	(0.048)	0.083~	(0.049)	0.177*	(0.072)	0.086	(0.058)
Apprentice vocational specificity	0.302***	(0.054)	0.239***	(0.054)	0.378***	(0.076)	0.138*	(0.060)
VET level (level 2 = ref.)								
Level 3	0.925***	(0.163)	0.578***	(0.168)	0.774**	(0.244)	0.015	(0.196)
Level 4	1.130***	(0.151)	0.628***	(0.158)	0.939***	(0.233)	0.725***	(0.189)
Educational sector (economics = ref.)								
Agriculture	0.200	(0.312)	0.004	(0.326)	-0.330	(0.467)	-0.182	(0.381)
Technology	0.403**	(0.140)	0.028	(0.143)	0.376~	(0.208)	0.150	(0.170)
Health	0.778***	(0.158)	0.420*	(0.165)	0.769**	(0.256)	0.664**	(0.205)
Social work	-0.146	(0.197)	-0.599**	(0.212)	-0.370	(0.339)	-0.093	(0.266)
Region level								
Regional youth unemployment rate	-0.105***	(0.031)	-0.044~	(0.025)	-0.033	(0.027)	0.006	(0.024)
Individual level								
Female (male = ref.)	0.000	(0.074)	-0.097	(0.071)	0.057	(0.067)	0.006	(0.067)
Age	-0.248***	(0.026)	-0.170***	(0.025)	-0.009	(0.025)	0.040	(0.025)
Migration background (Native Dutch = ref.)								
Western	-0.289*	(0.115)	-0.100	(0.114)	-0.067	(0.109)	-0.443***	(0.105)
Non-western	-0.927***	(0.073)	-0.573***	(0.085)	-0.346***	(0.087)	-0.306***	(0.088)
Parents' education (low = ref.)								
Intermediate	0.067	(0.070)	0.048	(0.064)	0.089	(0.060)	0.185**	(0.059)
Higher	-0.085	(0.076)	-0.128~	(0.069)	0.079	(0.066)	0.155*	(0.066)
Missing	0.420***	(0.093)	-0.119	(0.104)	-0.056	(0.100)	0.140	(0.100)
Average graduation grade	0.064*	(0.026)	0.070**	(0.025)	0.104***	(0.024)	0.160***	(0.024)
Specific skills			0.208***	(0.026)	0.378***	(0.025)	0.213***	(0.025)
Generic skills			-0.053*	(0.027)	-0.194***	(0.026)	-0.107***	(0.026)
Graduation year (2010 = ref.)								
2011	-0.274~	(0.160)	0.079	(0.128)	-0.093	(0.119)	-0.172	(0.121)
2012	-0.513***	(0.122)	-0.227*	(0.093)	-0.398***	(0.089)	-0.445***	(0.091)
2013	-0.869***	(0.146)	-0.289*	(0.122)	-0.435***	(0.117)	-0.351**	(0.119)
2014	-0.588***	(0.123)	-0.104	(0.095)	-0.378***	(0.090)	-0.296**	(0.092)
Intercept	1.713***	(0.187)	1.175***	(0.177)	0.211	(0.237)	0.687***	(0.200)
N regions	2,478		2,260					
N programs	114		114					
Variance unemployment rate	0.004	(0.066)	0.001	(0.032)	0.005	(0.070)	0.001	(0.025)
Variance region level	0.015	(0.124)	0.004	(0.065)	0.000	(0.000)	0.035	(0.186)
Variance program level	0.190	(0.436)	0.235	(0.485)	0.673	(0.820)	0.407	(0.638)
Log likelihood	-5,017.5		-5,543.7		-5,981.9		-6,016.4	

*Source: VET survey 2011-2015 and VET expert survey 2011; total sample N = 15,571; employed sample N = 11,678. *** p <0.001; ** p <0.01; *p <0.05; ~ p <0.10 (two-tailed).*

Table 4.4 | Results of interaction effects (skills) logistic 3-level models of school-leavers' labor market chances (logit effects).

	Total Sample		Employed Sample					
	Paid job		Immediate entry		Horizontal match		Vertical match	
	b	(SE)	b	(SE)	b	(SE)	b	(SE)
Program level								
Skill vocational specificity	0.032	(0.048)	0.086~	(0.049)	0.177*	(0.072)	0.086	(0.058)
Apprentice vocational specificity	0.302***	(0.054)	0.239***	(0.054)	0.378***	(0.076)	0.138*	(0.060)
Skill vocational*unemployment	0.029	(0.026)	-0.008	(0.023)	0.002	(0.025)	0.000	(0.022)
VET level (level 2 = ref.)								
Level 3	0.920***	(0.164)	0.577***	(0.168)	0.774**	(0.244)	0.015	(0.196)
Level 4	1.128***	(0.152)	0.630***	(0.158)	0.939***	(0.233)	0.725***	(0.189)
Educational sector (economics = ref.)								
Agriculture	0.200	(0.314)	0.004	(0.326)	-0.330	(0.467)	-0.182	(0.381)
Technology	0.401**	(0.140)	0.027	(0.143)	0.376~	(0.208)	0.150	(0.170)
Health	0.773***	(0.160)	0.419*	(0.165)	0.769**	(0.256)	0.664**	(0.205)
Social work	-0.143	(0.200)	-0.599**	(0.212)	-0.370	(0.339)	-0.093	(0.266)
Region level								
Regional youth unemployment rate	-0.101**	(0.031)	-0.044~	(0.025)	-0.033	(0.027)	0.006	(0.024)
Individual level								
Female (male = ref.)	0.001	(0.074)	-0.097	(0.071)	0.057	(0.067)	0.006	(0.067)
Age	-0.248***	(0.026)	-0.170***	(0.025)	-0.009	(0.025)	0.040	(0.025)
Migration background (Native Dutch = ref.)								
Western	-0.289*	(0.115)	-0.101	(0.114)	-0.067	(0.109)	-0.443***	(0.105)
Non-western	-0.928***	(0.073)	-0.573***	(0.085)	-0.346***	(0.087)	-0.306***	(0.088)
Parents' education (low = ref.)			0.048	(0.064)				
Intermediate	0.067	(0.070)	-0.128	(0.069)	0.089	(0.060)	0.185**	(0.059)
Higher	-0.085	(0.076)	-0.119~	(0.104)	0.079	(0.066)	0.155*	(0.066)
Missing	0.420***	(0.093)	0.048	(0.064)	-0.056	(0.100)	0.140	(0.100)
Average graduation grade	0.065*	(0.026)	0.070**	(0.025)	0.104***	(0.024)	0.160***	(0.024)
Specific skills			0.208***	(0.026)	0.378***	(0.025)	0.213***	(0.025)
Generic skills			-0.053*	(0.027)	-0.194***	(0.026)	-0.107***	(0.026)
Graduation Year (2010 = ref.)								
2011	-0.271~	(0.160)	0.078	(0.128)	-0.093	(0.119)	-0.172	(0.121)
2012	-0.511***	(0.122)	-0.228*	(0.093)	-0.398***	(0.089)	-0.445***	(0.091)
2013	-0.868***	(0.146)	-0.289*	(0.122)	-0.434***	(0.117)	-0.351**	(0.119)
2014	-0.587***	(0.123)	-0.104	(0.095)	-0.378***	(0.090)	-0.296**	(0.093)
Intercept	1.717***	(0.188)	1.176***	(0.177)	0.211	(0.237)	0.687***	(0.200)
N regions	2,478		2,260					
N programs	114		114					
Variance unemployment rate	0.004	(0.060)	0.001	(0.032)	0.005	(0.071)	0.001	(0.025)
Variance region level	0.016	(0.127)	0.004	(0.065)	0.000)	(0.000)	0.035	(0.186)
Variance program level	0.191	(0.437)	0.235	(0.485)	0.673	(0.820	0.407	(0.638)
Log likelihood	-5,016.9		-5,543.7		-5,981.9		-6,016.4	

*Source: VET survey 2011-2015 and VET expert survey 2011; total sample N = 15,571; employed sample N = 11,678. *** p <0.001; ** p <0.01; *p <0.05; ~ p <0.10 (two-tailed).*

Table 4.5 | Results of interaction effects (apprenticeship) logistic 3-level models of school-leavers' labor market chances (logit effects).

	Total Sample		Employed Sample					
	Paid job		Immediate entry		Horizontal match		Vertical match	
	b	(SE)	b	(SE)	b	(SE)	b	(SE)
Program level								
Skill vocational specificity	0.026	(0.048)	0.084~	(0.049)	0.176*	(0.072)	0.085	(0.058)
Apprentice vocational specificity	0.312***	(0.055)	0.241***	(0.054)	0.385**	(0.076)	0.141*	(0.061)
Apprentice vocational*unemployment	0.039	(0.031)	-0.019	(0.027)	0.036	(0.028)	0.011	(0.024)
VET level (level 2 = ref.)								
Level 3	0.925***	(0.163)	0.578***	(0.168)	0.775**	(0.244)	0.015	(0.196)
Level 4	1.128***	(0.151)	0.628***	(0.158)	0.937***	(0.233)	0.724***	(0.189)
Educational sector (economics = ref.)								
Agriculture	0.203	(0.313)	0.006	(0.327)	-0.332	(0.468)	-0.183	(0.381)
Technology	0.406**	(0.140)	0.026	(0.143)	0.380~	(0.209)	0.152	(0.170)
Health	0.784***	(0.159)	0.422*	(0.165)	0.771**	(0.256)	0.664**	(0.205)
Social work	-0.128	(0.199)	-0.592**	(0.213)	-0.370	(0.341)	-0.091	(0.267)
Region level								
Regional youth unemployment rate	-0.098**	(0.032)	-0.046~	(0.025)	-0.027	(0.028)	0.007	(0.024)
Individual level								
Female (male = ref.)	-0.001	(0.074)	-0.096	(0.071)	0.056	(0.068)	0.006	(0.067)
Age	-0.249***	(0.026)	-0.170***	(0.025)	-0.010	(0.025)	0.039	(0.025)
Migration background (Native Dutch = ref.)								
Western	-0.287*	(0.115)	-0.101	(0.114)	-0.066	(0.109)	-0.442***	(0.105)
Non-western	-0.927***	(0.073)	-0.572***	(0.085)	-0.348***	(0.087)	-0.306***	(0.088)
Parents' education (low = ref.)								
Intermediate	0.065	(0.071)	0.049	(0.064)	0.087	(0.060)	0.184**	(0.059)
Higher	-0.087	(0.076)	-0.127~	(0.069)	0.077	(0.066)	0.154*	(0.066)
Missing	0.419***	(0.093)	-0.120	(0.104)	-0.056	(0.100)	0.140	(0.100)
Average graduation grade	0.065*	(0.026)	0.070**	(0.025)	0.105***	(0.024)	0.160***	(0.024)
Specific skills			0.208***	(0.026)	0.379***	(0.026)	0.214***	(0.025)
Generic skills			-0.053*	(0.027)	-0.194***	(0.026)	-0.107***	(0.026)
Graduation Year (2010 = ref.)								
2011	-0.270~	(0.160)	0.077	(0.128)	-0.089	(0.119)	-0.170	(0.121)
2012	-0.513***	(0.122)	-0.228*	(0.093)	-0.397***	(0.089)	-0.445***	(0.091)
2013	-0.869***	(0.146)	-0.288*	(0.122)	-0.435***	(0.117)	-0.351**	(0.119)
2014	-0.588***	(0.123)	-0.104	(0.095)	-0.378***	(0.090)	-0.296**	(0.092)
Intercept	1.715***	(0.188)	0.241***	(0.054)	0.213	(0.237)	0.688***	(0.200)
N regions	2,478		2,260					
N programs	114		114					
Variance unemployment rate	0.005	(0.067)	0.001	(0.030)	0.006	(0.079)	0.001	(0.024)
Variance region level	0.016	(0.127)	0.004	(0.063)	0.000	(0.000)	0.035	(0.187)
Variance program level	0.192	(0.438)	0.236	(0.486)	0.673	(0.821)	0.407	(0.638)
Log likelihood	-5,016.7		-5,543.5		-5,981.1		-6,016.3	

*Source: VET survey 2011-2015 and VET expert survey 2011; total sample N = 15,571; employed sample N = 11,678. *** p <0.001; ** p <0.01; *p <0.05; ~ p <0.10 (two-tailed).*

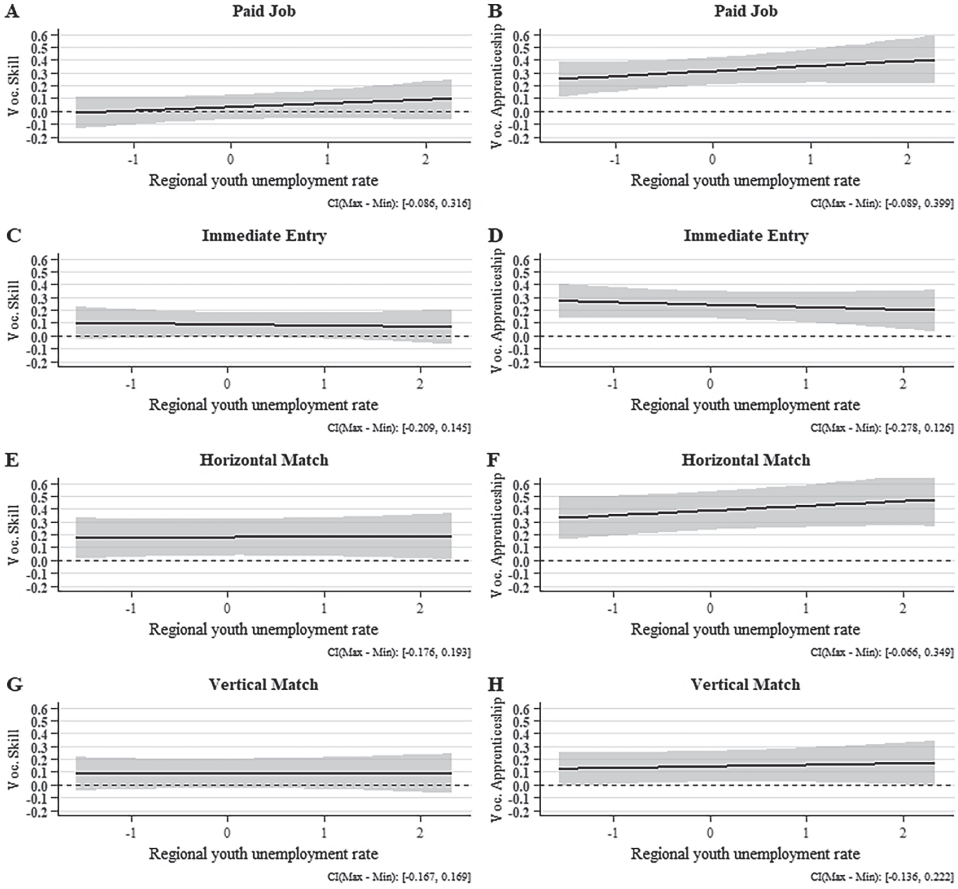

Figure 4.4 | Marginal effects of vocational measures (y-axis) on youth's labor market chances conditional on values of regional unemployment rate (x-axis).

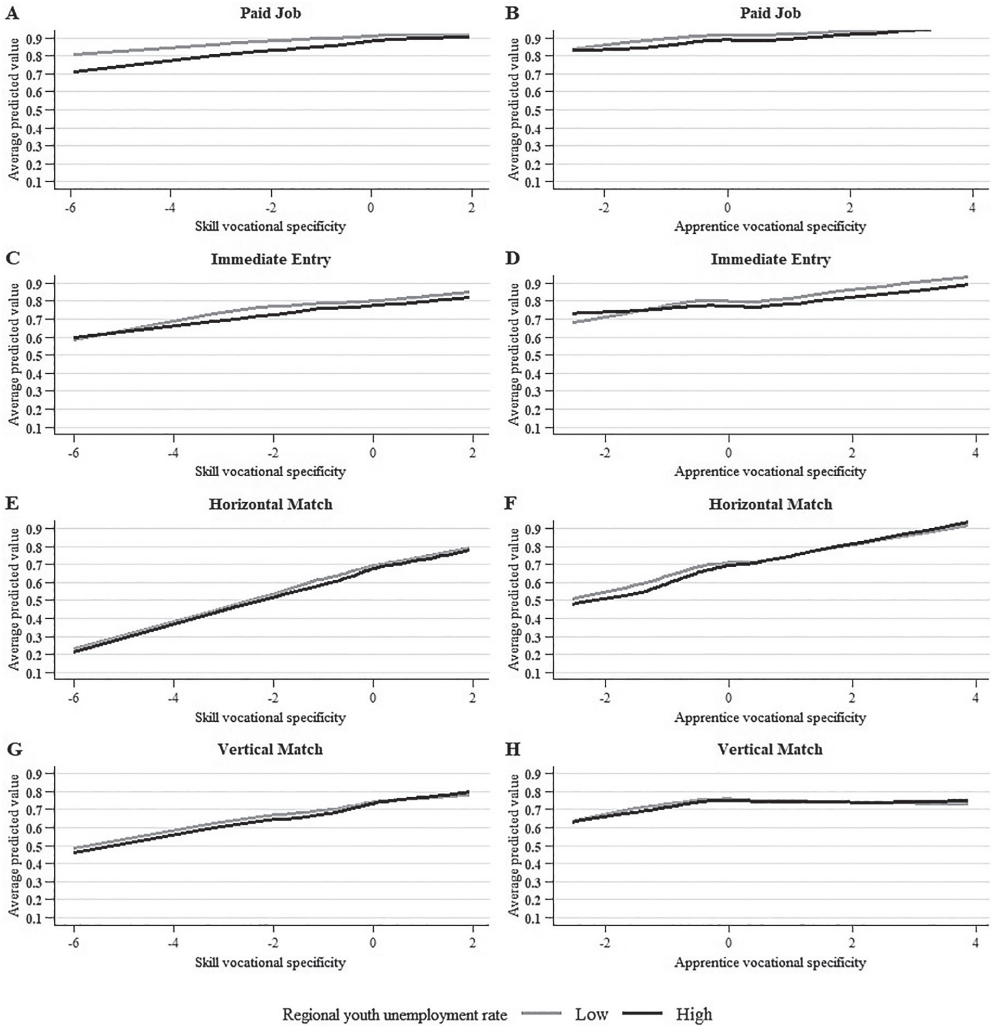

Figure 4.5 | Average predicted values on labor market outcomes based on (average marginal effects of) vocational measures with low and high regional youth unemployment.

4.8 Conclusion and discussion

Previous research has repeatedly demonstrated that school-leavers from vocationally specific educational systems experience a better integration into the labor market (e.g. Barbieri et al., 2016; Bol & Van de Werfhorst, 2013, 2011; Levels et al., 2014). Yet, both empirically and theoretically, notably less is known about the within-country heterogeneity in the vocational specificity of vocational education and training (VET) – i.e. about the variation between educational programs. Moreover, little is known about the impact of regional economic conditions on the relationship between the vocational specificity of educational programs and youth's labor market chances. This study shed more light on these issues, focusing on the context of Dutch VET.

This study, first of all, aimed to answer the question: *To what extent does the vocational specificity of educational programs in VET promote school-leavers' labor market integration?* Our findings showed that the specificity of educational programs in terms of amount of apprenticeship training during the program improved school-leavers chances in terms of all labor market outcomes under investigation; it increased school-leavers' chances of having paid work, of immediate job entry after graduation, and of having a job that matches their (or a related) level and field of education (i.e. vertical and horizontal job matching). Apprenticeships may facilitate youth labor market integration, because employers favor students who have a pre-existing relationship with the firm (Di Stasio & Van de Werfhorst, 2016). This applied to 47 percent of the school-leavers in our sample, indicating that workplace training operated as a 'foot in the door', which is in accordance with findings of a recent study by Protsch (2017). However, when measuring the vocational specificity of programs as the extent to which vocational knowledge and skills are provided in the program, we only found a positive impact on school-leavers' chances of immediate job entry and of having a job that matches their own (or related field) of education (i.e. horizontal job matching). We provide two possible explanations for these findings, which at the same time also explain why the apprenticeship measure overall had an more positive impact than the skill specificity measure.

It boils down to two ways in which more vocationally specific programs may improve youth's chances in the labor market: by means of (direct) contact with the labor market (i.e. network mechanisms) and clearer signals sent to employers (i.e. queuing mechanisms). Programs with more apprenticeship training obviously involve more apprenticeship training but also a stronger involvement of employers in the program. Both of these aspects may have increased (a) contact between students and employers, and (b) the *signaling* power of qualifications, which may explain why students from these programs had better chances to have a paid job, enter a job more quickly and have a job that matches their educational qualifications (Breen, 2005; Iannelli & Raffe, 2007; Levels et al., 2014; Scherer, 2005).

Educational programs that were strongly oriented towards providing students with *vocational skills and knowledge* seemed to generally have a positive influence on school-leavers' chances of immediate entry and horizontal matching. The amount of apprenticeship training within programs seems to be a stronger signal for employers to rely on than the vocational specificity of a program (i.e. amount of vocational skills and knowledge), but it might also be an indication that network mechanisms are particularly important for increasing young people's labor market opportunities. Altogether, our findings indicate that strong signaling and network mechanisms can increase school-leavers' labor market opportunities in well-developed occupational labor market such as the Netherlands. These signaling or network processes seem to work especially through a program's amount of apprenticeship training. This might be of interest for future research aiming to further unravel which program features promote youth labor market integration and why, but also for policymakers who aim to improve the school-work transition among recent graduates.

The second research question was: *To what extent do regional unemployment rates influence the positive impact of the vocational specificity of educational programs in VET on school-leavers' labor market integration?* We found that a higher regional youth unemployment rate decreases youth's chances of having a paid job and experiencing immediate job entry, which is in line with previous (country-comparative) research (De Lange et al., 2014; Scherer, 2005; Van der Velden & Wolbers, 2007; Wolbers, 2007a). However, importantly, the vocational impact does not turn into a penalty in regions where youth unemployment rates are higher, at least not within the Dutch VET context. This finding thus seems to indicate that school-leavers from more specific educational programs are not less flexible or more limited in their labor market opportunities in case of a deterioration of macro-economic conditions.

However, some caution is in order when interpreting this result. First, in our study, school-leavers' labor market chances are largely unrelated to differences in youth unemployment between regions in the Netherlands, perhaps because it is a relatively small country with fewer regional variations and considerably shorter commutes to other regions. Second, the regional youth unemployment rates were fairly stable over the five years we took into account, but it is possible that evidence of this relationship might have been found in times of an economic recession. Hence, it is important to re-investigate whether the vocational impact varies with macro-economic conditions in future research. So far, studies theorizing and testing this moderating role are conspicuously absent, while the answer to this question may be particularly valuable for policymakers. This question thus needs to be re-examined in order to be able to give a well-rounded answer to this question.

We would like to point out some limitations of this study, which may be addressed in future research. First, we cannot exactly pinpoint which of the two theoretical mechanisms that we discussed on our theory section – focusing on signals or networks respectively –

underlie the vocational effects we observed, something that is a challenge in much of the research in this field (Bills, 2003; Di Stasio & Van de Werfhorst, 2016; Van de Werfhorst, 2011a). Future studies may seek to advance our insights in this respect, although it is also worth noting that these theories are not necessarily mutually exclusive and describe mechanisms that can operate simultaneously (Iannelli & Raffe, 2007, p. 50).

Second, a question that could not be addressed with the data used in this study, but that merits attention in the future is whether all school-leavers benefit from graduating from a more vocationally specific program to the same extent. Recent research has drawn attention to the fact that such benefits (e.g. employment, earnings) may be higher for employees who are end up in occupations that match their educational qualifications (see Bol et al., 2019).

Finally, future research may strive to base the vocational specificity measures on information on from larger numbers of VET professionals per educational program, to further improve the reliability of these measures. However, compared to measures of programs' vocational specificity used in prior research (e.g. Coenen et al., 2015; Forster & Bol, 2018, Hanushek et al., 2017; Van der Velden & Wolbers, 2007), our measures were in unique in the sense that they were not extrinsically linked to labor market outcomes but rather based on the educational programs itself.

Altogether, this study showed that there is indeed within-country heterogeneity in the vocational specificity of educational programs. Hence, we provided more nuanced insights in the vocational impact by focusing on differences *between* programs in upper secondary VET. We moved beyond treating vocational education within a country as a homogeneous entity (Raffe, 2014, p. 182), and – in line with other research (Di Prete et al., 2017; Forster & Bol, 2018; Vogtenhuber, 2014) – found that the vocational specificity of educational programs is indeed gradual instead of dichotomous. Drawing on theoretical approaches focusing on queuing and networks mechanisms, we argued that possible differences in vocational specificity between VET programs may affect youth labor market integration. We were showed that more vocationally specific educational programs – especially those with a stronger emphasis on apprenticeship training – increase VET school-leavers' labor market opportunities in the Netherlands.

Notes

[1] Immediate labor market entry was actually also measured among unemployed school-leavers (at the time of the survey). However, because we wanted to take into account the confounding role of specific and generic skills, which was only measured among employed individuals, we decided to present these findings. We did run the models on the total sample, which showed that the main findings are comparable (available upon request).

[2] To ascertain that our results are not affected (in that we drew erroneous conclusions) by our choice for a specific measurement of regional youth unemployment rates, we conducted sensitivity analyses using a different measurement. Specifically, we used information that Statistics Netherlands (2016) provides about 'the share of young people (ages 15-25) in the labor force without work but available for and seeking employment', which is also available for different regions. We reran our three-level logistic models with this alternative indicator and found that these findings (available upon request) do not differ substantially from our main models with our original indicator.

[3] Within the VET expert survey, 48.9 percent of all educational programs (n = 133) is rated by only one respondent. To assess whether this endangers the reliability of the scores assigned by the raters, we used the programs (in the same location) that were rated by more than one rater to assess the extent to which coders' assessments of a program tend to overlap. That these intercoder reliability tests showed a strong agreement between raters, indicates that the fact that part of the programs were rated by one respondent does not present a serious problem.

CHAPTER 5

The macro level:

The vocational impact of educational systems and programs on young people's labor market outcomes*

* A slightly different version of this chapter is currently under review at an international Journal. Co-authors are Lieselotte Blommaert, Maurice Gesthuizen and Maarten H. J. Wolbers.

5.1 Introduction

It is well-established that national educational systems play a pivotal role in preparing young people for and allocating them to the labor market (Raffe, 2008, 2014). One institutional feature that particularly garners attention in school-to-work literature is the vocational specificity of the educational system, which refers to the extent to which educational programs prepare students for specific occupations and provide them with job-relevant skills that are in demand by employers (Allmendinger, 1989; Blossfeld, 1992; Shavit & Müller, 1998). There appears to be a broad consensus among researchers that in countries with a more prominent vocational education and training (VET) system, young adults have a smoother transition into the labor market in terms of employment, job status, and wages (Barbieri, Cutili, & Passaretta, 2016; Breen, 2005; De Lange et al., 2014; Van de Werfhorst, 2011a; Wolbers, 2007a). There are several mechanisms that are most often invoked in this literature to explain this finding (see Blommaert et al., 2020).

First, highly vocational systems provide students – especially those in vocational programs – with more job-specific skills necessary for performing the job, which is valuable for employers (Arum & Shavit, 1995; Blossfeld, 1992). Second, educational degrees in these systems show a clearer transparency of the qualifications and skills acquired in educational programs and thereby send clearer signals of productivity to employers (Breen, 2005). Moreover, it is often argued that in these systems vocational degrees send stronger signals of immediate productivity to employers than more general degrees at the same level (e.g. Scherer, 2005, p. 430, 435). Third, these systems are characterized by a high amount of institutionalized apprenticeship training established through close linkages between education and the labor market (Blossfeld, 1992; Shavit & Müller, 1998). Employers and trade unions have a large and active involvement in the curriculum of vocational programs and have therefore more direct knowledge of the programs and the students they recruit (Iannelli & Raffe, 2007, p. 50). Although the exact mechanisms are often left unspecified, it is because of a combination of skills, educational signals, and social networks, that school-leavers in highly vocational systems are assumed to have a smoother transition into the labor market than those in less vocationalized systems (Bol & Van de Werfhorst, 2011; Blommaert et al., 2020; Van de Werfhorst, 2011a; Wolbers, 2007a).

However, sociological comparative research tends to treat an educational system as if it is a homogeneous entity, and as if (the impact of) the degree of vocational specificity at the institutional level equally applies to all educational programs within a country (DiPrete et al., 2017, p. 1870; Raffe, 2014, p. 182). As a consequence, the aforementioned theoretical arguments have been applied at the aggregated level of educational systems, while they may largely manifest themselves at the level of educational programs, and thus explain variations between educational programs within countries (Raffe, 2014, p. 179). Following these same arguments, it is often also assumed that particularly school-leavers from vocational programs have a smoother transition, especially in highly vocational

systems (e.g. Scherer, 2005; Shavit & Müller, 1998). Yet, many previous comparative studies focusing on the vocational impact of education at aggregated units of analysis either did not theorize or empirically test whether school-leavers from vocational tracks have a smoother transition into the labor market than their counterparts from general tracks (Andersen & Van de Werfhorst, 2010; Barbieri et al., 2016; Bol & Van de Werfhorst, 2011; Breen, 2005; De Lange et al., 2014; Van de Werfhorst, 2011a). So far, the few studies that simultaneously tested micro level and macro level effects of vocational schooling do find support for the proposition at the country level, while empirical results regarding the expected micro level relationship between vocational programs and labor market outcomes have been ambiguous (Iannelli & Raffe, 2007; Wolbers, 2007a).

This raises the question to what extent the literature has correctly estimated the vocational impact of educational systems, given that these effects may vary within systems (Blommaert et al., 2020; Raffe, 2014; Rözer & Van de Werfhorst, 2020). Without taking into account the role of the vocational specificity of educational programs within these systems, the magnitude of the vocational impact at the aggregated unit of analysis might be overestimated in current literature. Moreover, the empirical ambiguity on the micro and macro level foundation has created a paradox that the literature has not yet resolved (DiPrete et al., 2017, p. 1876). Using PIAAC data enriched with information from the Labor Force Surveys, the present study tackles this issue by simultaneously investigating the influence of institutionalized specificity of national education systems and the specificity of educational programs within aggregate education systems on young people's employment chances and wages. Our first research question therefore reads: *To what extent does the vocational specificity of educational systems have an impact on young people's employment chances and wages when the specificity of their completed educational programs is taken into account, as well as individual educational level and cognitive skills?*

We contribute to existing research in two more ways. First and related to the former, we move beyond the simple divide between individuals in vocational and general tracks commonly used in comparative research (e.g. Barbieri et al., 2016; De Lange et al., 2014; Forster & Bol, 2018). For this, we bridge this line of comparative research with more recent country case studies that look into the within-country heterogeneity of the vocational impact of educational programs (DiPrete et al., 2017; Bol et al., 2019; Forster & Bol, 2018; Rözer & Van de Werfhorst, 2020). Comparative research typically divides school-leavers into those who completed vocational versus general tracks in upper secondary or post-secondary non-tertiary education (e.g. Bol & Van de Werfhorst, 2011; Levels et al., 2014; Wolbers, 2007a). This body of research thus assumes that all programs within these tracks are equally vocationally specific (Forster & Bol, 2018, p. 179). We, however, argue that there is substantial heterogeneity in specificity between programs, even within educational levels and tracks (see also Bol et al., 2019). We use an improved measurement developed by DiPrete et al. (2017), which measures the vocational specificity of programs through the observed number of occupational positions a single educational program is "linked"

to. To our knowledge, no study has implemented this granular measurement within a cross-national design before. By doing so, we are able to uncover the contributions of the vocational specificity at the level of institutions (macro) and the level of educational programs (meso) on young people's employment chances and wages, while taking account for education and cognitive skills at the individual level (micro).

Second, looking further into the vocational specificity at the meso level of educational programs, we provide novel insights into whether the impact of the specificity of educational programs varies with aggregate unemployment rates of countries. It is well-established that macro-economic conditions negatively affect youth's opportunities in the labor market (e.g. De Lange et al., 2014). However, conspicuously little is known about the extent to which the vocational impact at the level of educational programs depends on and varies with the macro-economic conditions of countries. Are more vocationally specific educational programs a blessing or a curse for school-leavers in countries with higher aggregate unemployment rates? On the one hand, school-leavers from more specific programs may less easily divert to other occupations in countries with poor macro-economic conditions (e.g. Coenen et al., 2015; Korpi et al., 2003). On the other hand, they may be less affected because access to the occupations that require occupational specialization are (and remain) restricted to those with the right credentials (Collins, 1979; Weeden, 2002). Hence, we contribute to existing insights by asking whether occupational specialization turns into a penalty in countries where aggregate unemployment levels are high or, conversely, whether it may act as a defense against unemployment and lower earnings. Hence, the second question this contribution addresses is: *To what extent does the vocational impact of educational programs vary with the macro-economic conditions of countries?*

5.2 Theoretical background

5.2.1 The vocational specificity of educational systems versus educational programs

Over the past two decades, comparative research on the impact of the vocational specificity of educational systems on people's labor market outcomes has rapidly expanded (for a literature- and meta-review, see Blommaert et al., 2020). These scholars have focused on a set of institutional features along which national educational systems were thought to differ, among which the vocational specificity of educational programs, in order to explain why in some countries the transition from education to work runs more smoothly than in other countries. By and large, the literature seems to reach the conclusion that these transitions run more smoothly in highly vocational educational systems (Barbieri et al., 2016; Breen, 2005; De Lange et al., 2014; Wolbers, 2007a). However, as the concept of vocational specificity has been primarily treated as an aggregated and

undifferentiated country-level variable without taking into account the actual specificity of educational programs that can vary considerably within national educational systems, it raises the question whether the literature has correctly estimated the vocational impact of educational systems (Blommaert et al., 2020; Raffe, 2014; Rözer & Van de Werfhorst, 2020).

The main limitation in current literature in comparing education-to-work transitions across countries is to take on a national educational system as a homogenous entity and, moreover, its institutional features, like the degree of vocational specificity, as undifferentiated country-level variables (Raffe, 2014). This implies that the degree of vocational specificity equally applies to all educational programs within that country as well as the effects to be the same for all school-leavers within that country. Even in countries that are classified as having a very general educational system, such as the United States is considered to be, there are highly vocational programs with strong linkages to occupations such as, for instance, in health or engineering. DiPrete et al (2017, p. 1875) argue that "this approach runs the risk overemphasizing internal institutional uniformity" and thereby underappreciating that variation in the actual specificity or linkage between educational programs and occupations within countries. We argue that this approach would be less problematic if the literature would also take into account empirically the heterogeneity in the vocational specificity at the level of educational programs.

A second and related limitation of the literature is that it applies micro-mechanisms at aggregated units of analysis in explaining why highly vocational educational systems are related to individuals' employment chances and wages, while these mechanisms manifest at the level of educational programs. In a literature review, Raffe (2014, p. 179) similarly states that this research tends to apply micro level explanations (such as human capital) that are more appropriate to micro than to macro processes, or at any rate more appropriate to analyses within countries than to comparisons between countries. By carrying out these micro-mechanisms at aggregated levels, researchers have abstracted away from the actual linkages between educational programs and occupational positions that, at a theoretical level, they nonetheless attest are central for school-to-work transitions (DiPrete et al., 2017, p. 1875).

Taken together, an eminent and quite remarkable gap in current literature is that, by not taking into account the vocational specificity at the level of educational programs, country comparative research so far has not accurately estimated the contributions of these mechanisms at the level of which they are thought to be at play. Thus, from a theoretical point of view we expect the vocational impact at the macrolevel to diminish if adequate account is taken of the vocational specificity of educational programs.

We address this gap by connecting country comparative research with a recent and growing body of literature that has been focusing on the within-country heterogeneity

of the vocational specificity of educational programs. These country-case studies have provided novel insights in the relationship between vocational education and the labor market by moving beyond the accustomed divide between general and specific qualifications (Bol et al., 2019; DiPrete et al., 2017). Instead, they adopted the granular "linkage approach" implemented by DiPrete et al. (2017), which expresses the strength of the link between educational qualifications and occupational positions. The present study incorporates this linkage approach into a cross-national design, which to our knowledge, no cross-national study has done before.

All in all, we argue that the vocational impact of education mainly manifests on the meso level and not so much on the macro level, both empirically and theoretically. Hence, we argue that the vocational impact of educational systems is much smaller than previously thought when the vocational specificity at the level of educational programs is taken into account.

5.2.2 The vocational impact of programs under different macro-economic conditions

Recent country-case studies that have implemented the linkage approach, albeit at the individual level rather than the program level, have demonstrated that graduates from vocationally specific programs have lower risks of unemployment and higher wage returns (Bol et al., 2019; DiPrete et al., 2017; Forster & Bol, 2019; Rözer & Bol, 2019). However, conspicuously little is known about the extent to which the vocational specificity of educational programs might vary with the macro economic conditions of countries. Our second research question therefore tackles this question, which, to our knowledge, no study has addressed before.

In highly vocationally specific programs, the acquisition of specific skills provides students with a strong specialization for and optimal preparation in a particular field of occupation, which is appealing for both students and employers (Hanushek et al., 2017). However, one might also argue that occupational specialization limits mobility across occupations (e.g. Korpi et al., 2003). In countries where macro-economic demand is low, school-leavers from highly vocational programs may be constrained in diverting to other occupations, and may therefore be exposed to higher risks of unemployment and lower wages due to, for instance, downward mobility (Protsch & Solga, 2016).

On the other hand, highly vocational programs may have a monopoly on the positions they are linked to: only school-leavers with the corresponding credential are suitable or allowed to perform the occupational tasks (e.g. Collins, 1979; Weeden, 2002). Hence, occupational specialization might be beneficial because it restricts access for outsiders (those without the credential), even when demand is low.

Altogether, we aim to illuminate whether the relationship between the vocational specificity of educational programs and young people's employment chances and wages is either stronger or weaker in countries where aggregate unemployment rates are higher.

5.3 Data

To answer our research questions, we used the data of the Programme for the International Assessment of Adult Competencies (PIAAC) from 2012 and 2015. Developed by the OECD and conducted in 23 countries in 2012 and 9 countries in 2015, the survey measures key cognitive skills, such as literacy, numeracy, and problem-solving skills. The survey also includes comparable information on individuals' sociodemographic background, among which, education type, employment status and salary. Our analyses were conducted on 19 of the 32 countries because for some countries there was (a) no access to free public use files (PUF), (b) no information on educational attainment in the PUF, (c) no information available on the macro indicators, or (d) no data was collected in the Labor Force Survey, which we used to calculate the vocational specificity measurement on the level of programs1.

Our analytical sample includes young adults aged between 18–34 who are no longer in formal education, have attained an upper secondary educational level or higher (because it is only from these levels that there is variation in educational field), and who have completed education not longer than 15 years ago. Respondents who are self-employed or who have attained a foreign educational qualification were excluded. This created an initial sample of 19,722 respondents.

To calculate the occupational specificity of educational programs, we use the linkage measure developed by DiPrete et al. (2017). We base our calculations on the European Labor Force Survey (LFS) data from 2012 and 2015, provided by Eurostat. According to DiPrete et al. (2017), using educational categories (i.e. combinations of educational level and field) with fewer than 100 observations can lead to sparseness bias. In order to prevent this and to ensure we have at least 100 observations for each educational category, we used the LFS data, rather than the PIAAC data, because the LFS have larger sample sizes. Similar inclusion criteria were used on this data, with the exception of selecting individuals who are within 15 years from the *typical* age – instead of the actual age – of school completion for their respective educational level (cf. DiPrete et al., 2017; Forster & Bol, 2018). The final measurement of each educational category was later added to the PIAAC data.

After listwise exclusion of missing cases, our sample consisted of 17,744 individuals (90.0 percent of the initial sample) in 319 educational programs in 19 countries. All continuous independent variables were standardized for the multilevel analyses. Descriptive statistics of our pre-standardized variables are shown in Table 5.1 below.

5.4 Measurements

5.4.1 Labor market outcomes

Employment measured whether respondents had a paid job (coded 1) or not (coded 0) in the week prior to the questionnaire. Information on the natural logarithm of *gross hourly wages* (PPP converted into US dollars) was available for respondents who had indicated to be in paid employment. We created an additional analytical sample in which we excluded the unemployed respondents (22.4 percent) and listwise deleted an additional 5.1 percent of missing cases on the outcome variable. To avoid possible distortion due to outliers, the bottom and top 1% of earners (1.5 percent) were also removed (cf. Lancee & Bol, 2017; Hanushek et al., 2017).

5.4.2 Vocational specificity of educational programs

We calculated the vocational specificity of educational programs following DiPrete et al. (2017), who use multigroup segregation methods to express the strength of the link between educational programs (defined both by level and field) and occupations. They refer to their method as the 'linkage approach' as it indicates the extent to which graduates from the same educational program are clustered in (and thus linked to) a set of occupations. The vocational specificity of an educational program is considered high if a large number of graduates is clustered into a narrow set of occupations, and low if graduates are spread out over a large number of different occupations. A more technical explanation of the calculation of the linkage approach follows below.

The calculation of the specificity of programs is based on the Mutual Information Index (*M*) (DiPrete et al., 2017; Mora & Ruiz-Castillo, 2011). The *M* index is the weighted sum of the linkage strength of all educational programs within a given country, where the weights are given by the relative size (i.e. the number of graduates) of each educational program. The total *M* is thus an aggregate indicator, but can be decomposed into a local linkage (M_g) for each educational program, which is our measure of the specificity of educational programs. The equation of the local linkage (M_g) is as follows:

$$M_g = \sum_j p_{j|g} \log \left(\frac{p_{j|g}}{p_j}\right) \quad (1)$$

In equation 1, $p_{j|g}$ is the conditional probability of being in occupation *j* given that one has completed educational program *g*, whereas p_j is the unconditional probability of working in occupation j for the entire employed population. The value of $p_{j|g}$ is multiplied by the logarithm of the ratio between the conditional probability and unconditional probability. This score is then aggregated over all occupations *j* to obtain the local linkage for a particular educational program *g*. Put simply, local linkage scores will be high if the

conditional probability is higher than the unconditional probability because, in that case, educational programs are strongly predictive of the occupations where graduates end up in.

The local linkage was calculated on LFS data from 2012 and 2015. As mentioned earlier, we used the same inclusion criteria as for the PIAAC data, and adopted a minimum cut-off point of 100 observations per category to prevent sparseness bias. Three variables were needed for calculating the local linkage scores: educational level, educational field, and occupation. In the LFS data as well as in PIAAC, educational information was coded according to the International Standard Classification of Education (ISCED), developed by UNESCO. As the educational categories were to match the categories in the PIAAC data, educational level and field were coded at 1-digit codes, resulting in three ISCED levels (3–5) and eight fields[2]. Occupational information was available via the International Standard Classification of Occupations (ISCO) 2008 at 3-digit codes, which is similar to DiPrete et al. (2017). The local linkage scores were later added to the PIAAC data by assigning them to the corresponding educational categories. For the sake of clarity and consistency, we refer to the local linkage as the vocational specificity of programs.

5.4.3 Macro indicators

VET index of educational systems is measured with the percentage of students enrolled in upper secondary vocational programs, because most vocational education takes place here. Following Bol and Van de Werfhorst (2013), we calculated the VET index with data from both the OECD (2014, 2017)[3] and UNESCO. A principal factor analysis was performed to generate a new index with a mean of 0 and a standard deviation of 1. The correlation between the original and our VET index was high (Pearson's r = 0.917).

Unemployment rate refers to the share of the labor force that is without work but available for and seeking employment and was collected by International Labor Organization (ILOSTAT). This ILO estimate was harmonized to ensure comparability across countries and over time. Figure C.1 in Appendix C illustrates the unemployment rate per country.

5.4.4 Control Variables

5.4.4.1 Country level

We controlled for external differentiation and employment protection legislation (EPL) as previous research has shown that these macro level characteristics affect school-to-work transition (e.g. Barbieri et al., 2016; Wolbers, 2007a). *External differentiation* refers to the length of tracking in primary and secondary education. Based on data from OECD (2013, 2014, 2016b, 2017), we retrieved information on the typical age when education starts, the age of first selection, and the age at the end of upper secondary education. Following

Brunello and Checchi (2007, p. 799) we calculated the length of tracking in education as the ratio of ($t - s$) to ($t - p$), where t is the age at the end upper secondary education, s is the age of first selection, and p is the age when primary education starts.

The *strictness of EPL* was measured with the OECD index capturing the strictness of regulation on the use of fixed-term and temporary employment work agency contracts. The higher the score (varying from 0–6), the stricter the regulation.

5.4.4.2 Individual level

We controlled for several socioeconomic background characteristics as they might influence the transition from school to work. We controlled for gender (0 for men and 1 for women), age (measured in years), educational level ("ISCED 3", "ISCED 4", and "ISCED 5"), numeracy and literacy skills (we took the first plausible values4 and divided the scores by 100 for better readability), migration background (0 if both parents were native-born and 1 if one of the parents was foreign-born), and parents' educational background of which the highest attained level was coded as such ("primary or lower secondary education", "upper secondary education", "tertiary education", and a category for missing values of both parents).

5.5 Analytical strategy and sensitivity analysis

Because individuals are nested within educational programs ($ICC_{employment}$=0.181, IC_{Cwages}=0.560), which, in turn, are nested in countries ($ICC_{employment}$=0.104, ICC_{wages}=0.465), three-level multilevel models were employed. In addition, to gauge the sensitivity of our main models, we conducted two additional sensitivity analyses.

First, for our binary outcome variable, employment, we estimated both logistic and linear probability multilevel models. We will present the linear probability models because the coefficients are easier to interpret and allow comparison across models (logistic models are presented in Table C.1 in Appendix C). Second, we reran our main models with fewer macro indicators to check if similar findings were found if the degrees of freedom are less burdened (models are available upon request). All in all, these sensitivity checks show similar results.

Table 5.1 | Pre-standardized descriptives of the employed sample and wages sample.

			Employed sample		Wages sample	
	Min	Max	Mean	SD	Mean	SD
Individual level						
Survey year						
2012	0.00	1.00	0.66		0.89	
2015	0.00	1.00	0.13		0.11	
Gender (ref.=male)						
Female	0.00	1.00	0.53		0.49	
Age	16.00	34.00	27.25	4.31	27.65	4.14
Parents' education						
Lower sec. education	0.00	1.00	0.16		0.15	
Upper sec. education	0.00	1.00	0.54		0.53	
Tertiary and higher	0.00	1.00	0.29		0.32	
Missing			0.01		0.01	
Migration background						
No	0.00	1.00	0.86		0.86	
Yes	0.00	1.00	0.14		0.14	
Educational level						
ISCED 3	0.00	1.00	0.53		0.49	
ISCED 4	0.00	1.00	0.06		0.05	
ISCED 5	0.00	1.00	0.41		0.45	
Cognitive skills						
Numeracy	0.58	4.63	2.80	0.47	2.85	0.45
Literacy	0.67	4.46	2.83	0.43	2.88	0.42
Educational program level						
Vocational specificity	0.21	3.01	1.13	0.56	1.14	0.57
Country level						
VET index	-0.91	1.56	0.49	0.85	0.49	0.85
External differentiation	0.09	0.68	0.32	0.20	0.32	0.20
Unemployment rate	8.04	53.09	23.69	12.67	23.69	12.67
EPL	0.54	3.75	2.17	0.87	2.17	0.87

Source: PIAAC 2012 and 2015; employed sample $N_{individuals}$*=17,744;* $N_{programs}$*=319;* $N_{countries}$*=19; wages sample* $N_{individuals}$*=12,748;* $N_{programs}$*=317;* $N_{countries}$*=19.*

5.6 Descriptive results

5.6.1 Descriptive results of young people's employment chances and wages

Figures 5.1 and 5.2 present the cross-national differences in (the share of) paid employment and gross hourly wages among young adults with at least an upper secondary educational qualification. Among this group, being in paid employment varies from 46 percent in Greece, to 92 percent in Norway. By and large, the share of people in paid employment seems to be higher in Northwestern European countries. Next, there is even larger variation in gross hourly wages between countries; from $7,78 in Greece to $22,41 in Norway.

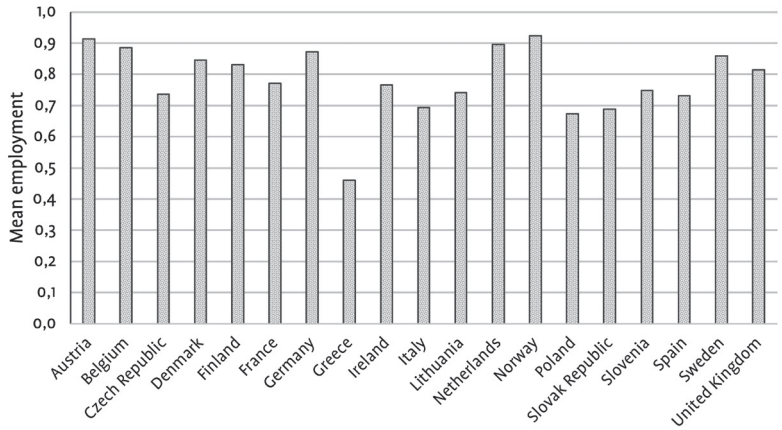

Figure 5.1 | Average paid employment across countries

Source: PIAAC 2012 and 2015; $N_{individuals}$=17,744.

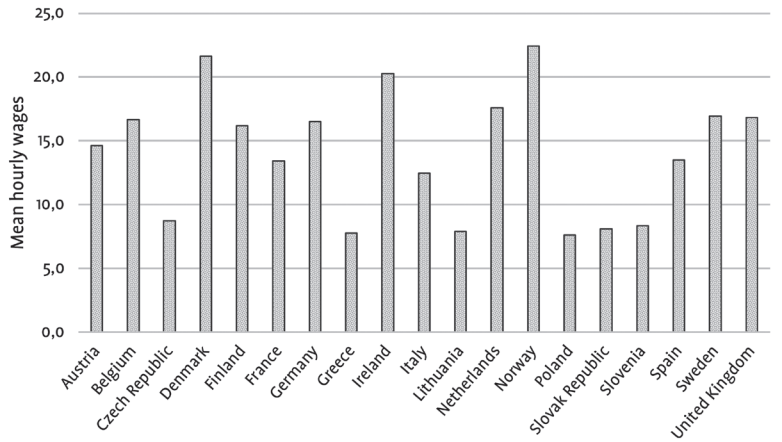

Figure 5.2 | Average gross hourly wages across countries.

Source: PIAAC 2012 and 2015; $N_{individuals}$=12,748.

5.6.2 Descriptive results of vocational specificity of educational programs and systems

To what extent does the vocational specificity of programs vary across countries? Figure 5.3 below shows that the average specificity of programs is the highest in Germany, Austria, and Denmark. Conversely, the average specificity is lower in the UK, Belgium, Italy, and Poland. These findings do seem to corroborate patterns found in comparative research: countries with a dual or extensive vocational system (i.e. the first group of countries) seem to have, on average, more vocationally specific programs. On the contrary, other results are rather surprising, such as the similarity in scores between the Netherlands and Ireland. Compared to Ireland, the Netherlands has an extensive VET sector at the upper secondary level and is therefore often clustered with the German-speaking countries.

However, we should be cautious in comparing the average program scores per country, as the relative size of the educational programs (i.e. number of graduates) may play an important role. We therefore turn to the national linkage score (i.e. *M* index) shown in Figure 5.4, which takes the relative size of programs into account. It thus allows a better comparison of the national structure of the linkage between educational programs and the labor market. Here, we see that some surprising results are no longer found. Ireland, Italy and the UK have the lowest scores; these are also the countries that have the least vocationally specific educational systems. Conversely, the countries that are typically considered to have to most vocationally specific systems have the highest scores, such as Austria, Germany, Denmark, and the Netherlands.

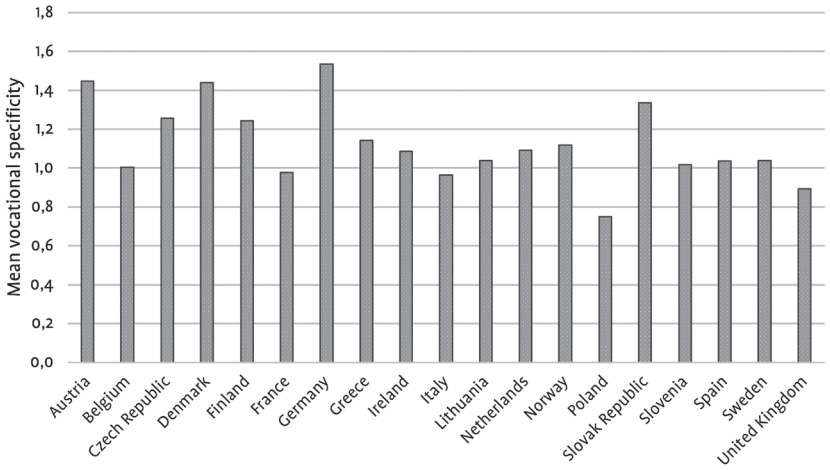

Figure 5.3 | Average vocational specificity of educational programs per country (i.e. local linkage M_g).
Source: PIAAC 2012 and 2015; $N_{programs} = 319$.

Lastly, we present the standardized VET index in Figure 5.5, which refers to the share of students enrolled in upper secondary vocational programs. The UK and Lithuania have the lowest share of VET students, whereas Austria, Belgium and Czech Republic have the highest prevalence of vocational enrollment.

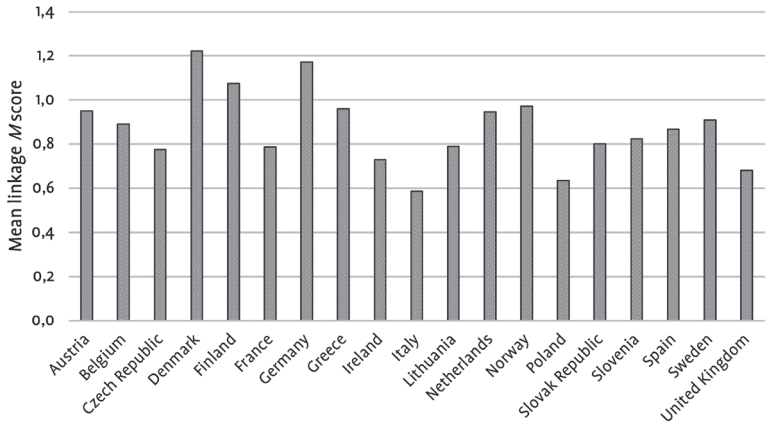

Figure 5.4 | Average linkage score at country level (i.e. M index).

Source: PIAAC 2012 and 2015; $N_{countries}$ = 19.

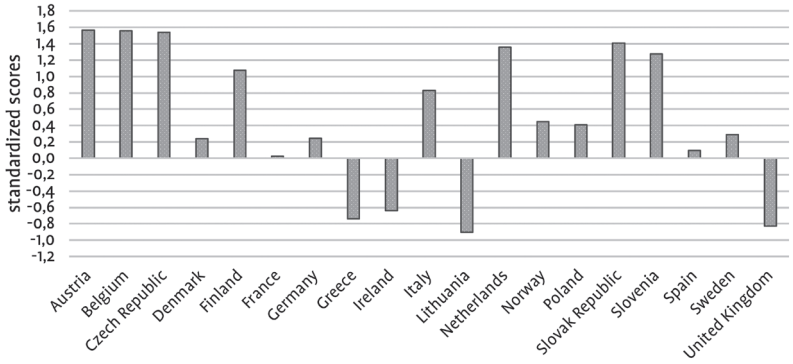

Figure 5.5 | VET index per country.

Source: PIAAC 2012 and 2015; $N_{countries}$ = 19.

5.7 Multilevel models

5.7.1 Employment chances

To what extent does the vocational specificity of educational systems explain the variation in people's employment chances and hourly wages, when we take into account the specificity of programs? The results of the linear probability and linear multilevel models of respectively employment and hourly wages are both presented in Table 5.2. For both, Model 1 is the full model presenting the effects of all independent variables. The cross-level interactions of the vocational specificity of programs with aggregate unemployment rates are added in Model 2.

Starting off with young people's employment chances, the findings in Model 1 show that the (macro) vocational specificity of educational systems does *not* affect young people's employment chances when controlling for the (meso) vocational specificity of programs, as well as for individual cognitive skills and education (micro) By contrast, the (meso) vocational specificity of educational programs does have a positive main effect on young people's employment chances. These findings demonstrate that while the vocational specificity at the level of educational programs does explain variation in young people's employment chances, the aggregated vocational specificity at the level of the educational system does not. In other words, the variation in the vocational specificity between educational programs rather than between educational systems explains variation in people's employment chances. This corroborates our expectation that prior country-comparative research has overestimated the macro effects of the vocational educational systems whilst neglecting the meso effects of the vocational specificity of educational programs.

Next, our second research question asks whether the (meso) impact of the vocational specificity of educational programs depends on and varies with aggregate unemployment rates. First of all, Model 1 shows a negative relationship between aggregate unemployment rates and individuals' employment chances, which is in line with empirical findings from previous research (e.g. De Lange et al., 2014; Wolbers, 2007a). Moreover, Model 2 shows that the vocational impact of programs does indeed vary with countries' macro-economic conditions, being weaker in countries with higher unemployment rates. The interaction effect is illustrated in Figure 5.6. Put simply, the specificity of programs increases young people's employment chances, but to a lesser extent in countries where unemployment rates are higher. This finding provides novel insights into current understandings of the relationship between vocational programs and young adults' employment chances.

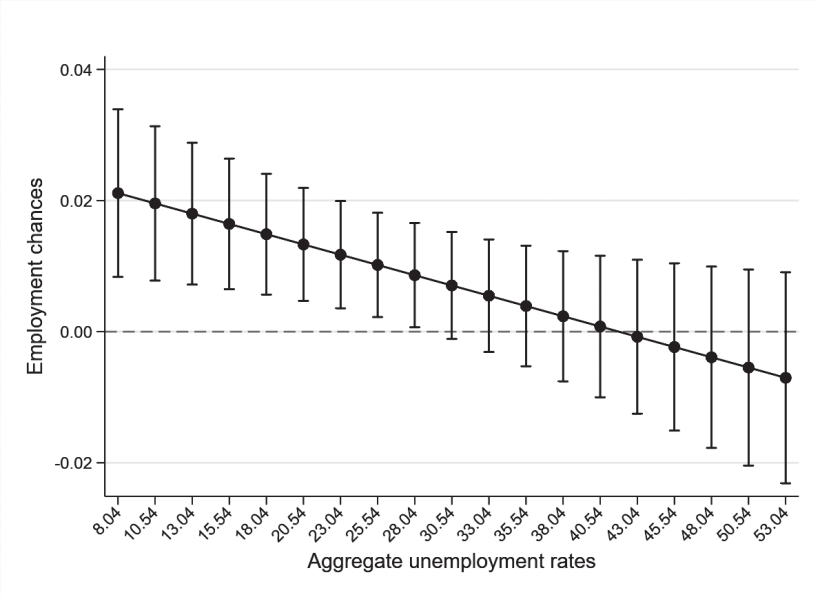

Figure 5.6 | Average marginal effects of vocational specificity of educational programs on employment chances, varying with aggregate unemployment rate.

5.7.2 Gross hourly wages

Turning to gross hourly wages, Model 1 shows that the (macro) vocational specificity of systems does not affect young people's hourly wages when we control for the (meso) vocational specificity of programs and for individual cognitive skills and education (micro). We also did not find an effect of the (meso) vocational specificity of programs on gross hourly wages. Based on these findings, we conclude that the vocational specificity at the level of educational programs as well as at the level of educational systems does not seem the increase gross hourly wages among young people.

The non-significant relation between the vocational specificity of educational programs and wages is not in line with recent country-case studies that did found a positive relation, albeit among the prime-age working population (Bol et al., 2019; DiPrete et al., 2017). However, these previous studies measured the vocational specificity of educational programs (i.e. the local linkage M_g) on the individual level rather than at the program level. We ran an additional robustness check in which we also modelled the specificity of programs at the individual level to see if this might be an explanation as to why our results for the linkage effect differs from the findings from the country-case studies (see Table C.2 in Appendix C). These findings do show a positive effect of the vocational specificity (at the individual level) on gross hourly wages. Although this is in line with findings from previous micro studies, it is important to consider why we find a positive effect. This is probably

caused by not recognizing the hierarchical structure, which leads to underestimating the standard errors of the regression coefficient and thereby overestimating the statistical significance of the vocational specificity of programs when measured at the individual level. Taking this into consideration and thus choosing for the most fitting hierarchical three-level multilevel structure, our conclusion remains that the specificity of educational programs does not increase gross hourly wages among workers.

Regarding the second research question, Model 1 first of all shows that in countries with higher aggregate unemployment rates, the average gross hourly wages among young people are lower. Next, Model 2 shows that the interaction of the specificity of programs with aggregate unemployment rates is not significant. We therefore conclude that the vocational impact of programs on young people's wages does not depend on countries' macro-economic conditions.

Table 5.2 | Results of linear probability and linear multilevel models of school-leavers' employment chances and hourly wages.

	Employed				Hourly wages			
	Model 1		Model 2		Model 1		Model 2	
	b	(se)	b	(se)	b	(se)	b	(se)
Individual level								
Intercept	0.795***	(0.015)	0.794***	(0.015)	1.104***	(0.033)	1.105***	(0.033)
Gender								
Female (male = ref.)	-0.113***	(0.029)	-0.113***	(0.029)	-0.046***	(0.003)	-0.046***	(0.003)
Age (27 = ref.)	0.053**	(0.009)	0.053***	(0.009)	0.047***	(0.001)	0.047***	(0.001)
Parents' education								
Lower secondary (= ref.)								
Upper secondary	0.031***	(0.010)	0.031***	(0.010)	0.010**	(0.004)	0.010**	(0.004)
Tertiary and higher	0.027~	(0.015)	0.028~	(0.015)	0.027***	(0.005)	0.027***	(0.005)
Missing	-0.056**	(0.026)	-0.055**	(0.026)	0.027~	(0.015)	0.027	(0.015)
Migration background								
Yes (no = ref.)	-0.052***	(0.010)	-0.053***	(0.010)	-0.009**	(0.004)	-0.009**	(0.004)
Survey year								
2015 (2012 = ref.)	-0.085***	(0.028)	-0.082***	(0.027)	-0.231***	(0.066)	-0.232**	(0.066)
Cognitive skills								
Numeracy	0.034***	(0.010)	0.034***	(0.010)	0.018***	(0.002)	0.018***	(0.002)
Literacy	0.001	(0.009)	0.001	(0.009)	0.008***	(0.002)	0.008***	(0.002)
Educational level								
ISCED 3 (= ref.)								
ISCED 4	-0.017	(0.034)	-0.017	(0.034)	0.019~	(0.010)	0.018~	(0.010)
ISCED 5	0.072***	(0.010)	0.073***	(0.010)	0.076***	(0.006)	0.076***	(0.006)
Program level								
Vocational specificity	0.012***	(0.004)	0.011***	(0.004)	0.003	(0.003)	0.003	(0.003)
Country level								
VET index	0.010	(0.013)	0.011	(0.013)	-0.009	(0.039)	-0.009	(0.039)
Unemployment rate	-0.063***	(0.011)	-0.061***	(0.011)	-0.058***	(0.021)	-0.059***	(0.021)
External differentiation	-0.015	(0.011)	-0.015	(0.011)	-0.059~	(0.031)	-0.059~	(0.031)
EPL	0.001	(0.009)	0.000	(0.009)	-0.016	(0.025)	-0.016	(0.025)
cross-level interactions								
Specificity*Unemployment			-0.007**	(0.003)			0.003	(0.002)
Variance								
country level	0.002	(0.001)	0.002	(0.001)	0.008	(0.003)	0.008	(0.003)
linkage at country level			0.000	(0.000)			0.000	(0.000)
program level	0.003	(0.001)	0.002	(0.001)	0.001	(0.000)	0.001	(0.000)
error / residual	0.153	(0.011)	0.153	(0.011)	0.021	(0.000)	0.021	(0.000)
Log likelihood	-8,611		-8,610		6,221		6,222	

*Source: PIAAC 2012 and 2015; employed sample: $N_{individuals}$ = 17,744; $N_{programs}$ = 319; $N_{countries}$ = 19; wages sample: $N_{individuals}$ = 12,748; $N_{programs}$ = 317; $N_{countries}$ = 19. *** p <0.01, ** p <0.05, ~ p <0.10 (two-tailed).*

5.8 Multilevel results for upper secondary vocational education

The vocational specificity of educational systems is typically measured as the share of students enrolled in upper secondary vocational education, because the vocational education and training (VET) typically takes place here (e.g. Levels et al., 2014; Shavit & Müller, 1998). So far, there is however no univocal evidence that more prominent VET systems are particularly good for those enrolled in vocational education (DiPrete et al., 2017). Moreover, most previous research relied on the assumption that all educational programs within VET are equally vocationally specific, and has therefore provided little insight into the possible heterogeneity in the vocational impact between programs *within* VET systems. We therefore aim to provide more insights into the vocational impact of educational systems among VET school-leavers, while taking into account the vocational specificity of their completed programs. To put it differently, we aim to further unravel meso and macro-level effects of vocational education on the labor market outcomes among those who have actually completed upper secondary education.

Starting off with employment chances, Model 1 in Table 5.3 shows that the vocational specificity of educational *systems* does not affect VET school-leavers' employment chances. Moreover, and in contrast, it does show that more vocationally specific educational *programs* young people's chances to find paid employment. Taken together, these two findings indicate that within upper secondary vocational education, it is especially the vocational specificity of educational programs that explains the variation in young people's employment chances, and not so much the aggregate vocational specificity of educational systems. These findings are similar to the ones we found among the entire analytical sample.

Next, Model 1 shows that aggregate unemployment rates decrease VET school-leavers' employment chances. Thus, lower employment chances are found among this group in countries with poorer macro-economic conditions. However, Model 2 shows that the impact of the vocational specificity of educational programs does not seem to vary with macro-economic conditions of countries. The analyses including all school-leavers (ISCED 3-5) pointed at diminishing returns of vocational specificity of programs under adverse macro-economic circumstances. A tentative explanation for this deviating finding might be that during economic downturns school-leavers from vocational specific programs, whose skills are less easily transferable, face more difficulties in competing with school-leavers whose education contained more generic elements, which give them entrance to a wider scope of occupations. If looking at upper secondary vocational graduates only, it turns out that economic downturns hit them equally hard, irrespective of how vocationally specific their educational program was.

Table 5.3 | Main results of employment chances and hourly wages among upper secondary vocational graduates, with VET index as the macro indicator.

	Employed				**Hourly wages**			
	Model 1		Model 2		Model 3		Model 4	
	b	(se)	b	(se)	b	(se)	b	(se)
Individual level								
Intercept	0.814***	(0.021)	0.822***	(0.039)	1.108***	(0.041)	1.094***	(0.045)
Gender	-0.177***	(0.044)	-0.177***	(0.044)	-0.066***	(0.005)	-0.066***	(0.005)
Female (male = ref.)								
Age (27 = ref.)	0.051***	(0.014)	0.051***	(0.014)	0.032***	(0.002)	0.032***	(0.002)
Parents' education								
Lower secondary (= ref.)								
Upper secondary	0.037***	(0.013)	0.037***	(0.013)	0.013~	(0.007)	0.013~	(0.007)
Tertiary and higher	0.038~	(0.020)	0.038~	(0.020)	0.016~	(0.008)	0.016~	(0.008)
Missing	-0.053	(0.043)	-0.053	(0.043)	0.045**	(0.022)	0.045**	(0.022)
Migration background								
Yes (no = ref.)	-0.041**	(0.017)	-0.041~	(0.017)	0.009	(0.007)	0.009	(0.007)
Survey year								
2015 (2012 = ref.)	-0.096***	(0.034)	-0.095**	(0.033)	-0.245***	(0.078)	-0.247***	(0.078)
Cognitive skills								
Numeracy	0.052***	(0.015)	0.052***	(0.015)	0.018***	(0.004)	0.018***	(0.004)
Literacy	-0.020	(0.014)	-0.020	(0.014)	0.006	(0.004)	0.006	(0.004)
Program level								
Vocational specificity	0.019~	(0.012)	0.023	(0.020)	-0.003	(0.005)	-0.009	(0.010)
Country level								
VET index	0.014	(0.018)	0.014	(0.018)	-0.005	(0.047)	-0.005	(0.047)
Unemployment rate	-0.077***	(0.020)	-0.073***	(0.024)	-0.064***	(0.025)	-0.071***	(0.027)
External differentiation	-0.009	(0.016)	-0.009	(0.016)	-0.070~	(0.036)	-0.070~	(0.036)
EPL	-0.000	(0.017)	-0.000	(0.017)	-0.010	(0.030)	-0.010	(0.030)
cross-level interactions								
Specificity*Unemployment			-0.000	(0.002)			0.001	(0.001)
Log likelihood	-3,121		-3,121		2,136		2,136	

Note. The models excluded Ireland as it had no graduates from upper secondary vocational education.
*Source: PIAAC 2012 and 2015; employed sample: $N_{individuals}$ = 17,744; $N_{programs}$ = 319; $N_{countries}$ = 19; wages sample: $N_{individuals}$ = 12,748; $N_{programs}$ = 317; $N_{countries}$ = 19. *** p <0.01, ** p <0.05, ~ p <0.10 (two-tailed).*

Moving to VET school-leavers' gross hourly wages, Model 3 shows that neither the vocational specificity at the level of educational systems nor at the level of educational programs increases VET school-leavers' wages. Furthermore, VET school-leavers in countries with higher aggregate unemployment rates do have, on average, lower gross hourly wages than their counterparts in countries dealing with lower shares of unemployment. Lastly, the interaction term in Model 4 is not significant, indicating that the impact of the vocational specificity of educational programs does not vary with

aggregate unemployment rates. All in all, these findings on gross hourly wages are similar to the main findings we found for the entire analytical sample.

Although the share of students enrolled in upper secondary vocational education (i.e. the VET index) is a good indicator of how prominent the VET sector is within educational systems, it does not make a distinction between vocational tracks that are (predominantly) work-based or school-based. One might argue that amongst school-leavers from VET, the share of vocational education that takes place in a dual form that combines firm-based vocational training and school-based education, is theoretically more interesting than the overall share of students enrolled in VET. When zooming in on the labor market opportunities of this group, it may be more relevant to measure the extent to which educational systems provide firm-based vocational training, which is a good indicator of the strength of the institutional linkage between vocational education and employers or firms (i.e. the labor market). The findings are summarized in Table 5.4.

Model 1 shows that in countries with a higher share of vocational education that takes place in a dual form, VET school-leavers have lower chances of finding paid employment. At the same time, the impact of the vocational specificity at the level of educational programs remains positive; VET school-leavers from more specific programs have better employment chances than those from less specific programs. These findings indicate that vocational education measured at different levels can also evoke different processes that can either hamper or promote entry to the labor market. This underlines once again the importance of including the vocational specificity of education both at the level of programs and systems. A tentative explanation for this negative vocational impact at the aggregated level of educational systems might be that in more prominent dual systems, it is harder for VET school-leavers – who do not succeed to enter the labor market via firm-based vocational training, which is captured at the level of programs – to find employment outside established networks with employers. This would be the case if the percentage of firm-based vocational education at the country level indicates the importance of established networks within a country's economy.

The remaining findings are similar to the findings in Table 5.3 and will therefore be discussed briefly. The vocational impact at either levels does not impact VET school-leavers' gross hourly wages. In countries with poorer macro-economic conditions, individuals from VET have lower employment chances and lower gross hourly wages. Lastly, aggregate unemployment rates do not seem the affect the relation between the vocational specificity of programs and VET school-leavers' employment chances or hourly wages.

Table 5.4 | Main results of employment chances and hourly wages among upper secondary vocational graduates, with % work-based vocational track as the macro indicator.

	Employed				**Hourly wages**			
	Model 1		Model 2		Model 3		Model 4	
	b	(se)	b	(se)	b	(se)	b	(se)
Individual level								
Intercept	0.857***	(0.027)	0.864***	(0.046)	1.089***	(0.046)	1.075***	(0.050)
Gender								
Female (male = ref.)	-0.178***	(0.044)	-0.178***	(0.044)	-0.066***	(0.005)	-0.066***	(0.005)
Age (27 = ref.)	0.051***	(0.014)	0.051***	(0.014)	0.032***	(0.002)	0.032***	(0.002)
Parents' education								
Lower secondary (= ref.)								
Upper secondary	0.037***	(0.013)	0.037***	(0.013)	0.013~	(0.007)	0.013~	(0.007)
Tertiary and higher	0.038	(0.020)	0.038~	(0.020)	0.016~	(0.008)	0.016~	(0.008)
Missing	-0.054	(0.044)	-0.053	(0.044)	0.045**	(0.022)	0.045**	(0.022)
Migration background								
Yes (no = ref.)	-0.040**	(0.017)	-0.040**	(0.017)	0.009	(0.007)	0.009	(0.007)
Survey year								
2015 (2012 = ref.)	-0.123***	(0.037)	-0.123***	(0.037)	-0.233***	(0.076)	-0.234***	(0.076)
Cognitive skills								
Numeracy	0.053***	(0.015)	0.053***	(0.015)	0.018***	(0.004)	0.018***	(0.004)
Literacy	-0.021	(0.014)	-0.021	(0.014)	0.006	(0.004)	0.006	(0.004)
Program level								
Vocational specificity	0.024**	(0.012)	0.027	(0.021)	-0.003	(0.005)	-0.010	(0.010)
Country level								
% in dual form	-0.119***	(0.042)	-0.119***	(0.042)	0.050	(0.113)	0.049	(0.112)
Unemployment rate	-0.088***	(0.016)	-0.084***	(0.022)	-0.060**	(0.026)	-0.067**	(0.027)
External differentiation	0.005	(0.013)	0.005	(0.013)	-0.075***	(0.029)	-0.075***	(0.028)
EPL	-0.002	(0.013)	-0.002	(0.013)	-0.010	(0.030)	-0.010	(0.030)
cross-level interactions								
Specificity*Unemployment			-0.000	(0.002)			0.001	(0.001)
Log likelihood	-3,119		-3,119		2,136		2,136	

Note. The models excluded Ireland as it had no graduates from upper secondary vocational education.

*Source: PIAAC 2012 and 2015; employed sample $N_{individuals}$ = 5,896; $N_{programs}$ = 130; $N_{countries}$ = 18; wages sample $N_{individuals}$ = 4,049; $N_{programs}$ = 130; $N_{countries}$ = 18. *** p <0.01, ** p <0.05, ~ p <0.10 (two-tailed).*

5.9 Conclusion and discussion

Over the past decades, comparative literature has almost exclusively treated the vocational specificity of education as an undifferentiated country-level variable to investigate the extent to which this institutional feature explains cross-national differences in young people's labor market outcomes (e.g. Allmendinger, 1989; Shavit & Müller, 1998). By focusing on the educational system-level, this body of research has disregarded the variation that is likely to exist *between* educational programs, even within educational systems that are classified as either highly vocational (e.g. Germany) or general (the United States) (DiPrete et al., 2017; Rözer & Van de Werfhorst, 2020). Although these studies often attest – at the theoretical level – that these mechanisms are at play at the level of educational programs (DiPrete et al., 2017), they have steered clear from taking into account the vocational specificity of educational programs. This is quite a remarkable gap in current literature, which begs the question whether country-comparative research has accurately estimated the vocational impact of educational systems, given that these effects may vary within systems. The present study tackles this issue by simultaneously investigating the impact of the vocational specificity of educational systems and of educational programs on young people's employment chances and wages.

This study, first of all, aimed to answer the question: *To what extent does the vocational specificity of educational systems have an impact on young people's employment chances and wages when the specificity of their completed educational programs is taken into account?* Findings show, first, that young people's employment chances do not seem to vary with the vocational specificity of educational systems when taking into account the vocational specificity of educational programs. This outcome does not align with the general view that more vocationally specific educational systems promote young people's employment chances (e.g. Barbieri et al., 2016; Breen, 2005). A recent meta-review by Blommaert et al. (2020) already demonstrated that the vocational impact of educational systems is not as consistent as it is sometimes portrayed to be – and this is even without taking into account the vocational specificity at the level of educational programs – and encouraged future studies to provide a more nuanced and accurate portrayal of the combined evidence (p. 15). Our simultaneous estimation of the impact of vocational specificity of educational systems and programs, accounting for individual cognitive skills and education, is a first step in this direction.

Second, and in contrast, we did find that the vocational specificity of educational programs does increase young people's employment chances whilst holding the vocational specificity of educational systems constant. In other words, young people who graduated from more vocational educational programs are more likely to be in paid employment than those from less specific programs, even when taking into account the overall vocational specificity of an educational system.

With regards to hourly wages, the vocational specificity of educational systems and educational programs likewise did not seem to be related to workers' hourly wages. We firstly conclude that young people's earnings are not necessarily higher in more prominent VET systems, which is in line with a recent meta-review covering the comparative school-to-work literature (Blommaert et al., 2020). Secondly, we did not find evidence that more specific educational programs increase young people's gross hourly wages. A few country-case studies did find this to be the case for prime aged workers in Germany, France, and the United States (Forster & Bol, 2018; Bol et al., 2019; DiPrete et al., 2017). Yet, besides studying a population that on average left school longer ago, these studies included the vocational specificity of educational programs at the individual level, likely resulting in an overestimation of its impact. Indeed, if modelled at the individual level, our models also showed a significant and positive impact of the vocational specificity of educational programs on young people's gross hourly wages. Once more, an accurate and simultaneous portrayal of the impact of vocational specificity seems crucial. We conclude that as yet, there is no compelling evidence that the vocational specificity of educational programs translates into higher wages. An interesting and new avenue for future research is to delve deeper into this relationship, for instance by describing variations in the impact of vocational specificity of educational programs between countries, explained by macro-structural or -institutional conditions.

All in all, this is the first comparative study to simultaneously investigate both the meso and macro level impact of the vocational specificity of education. We are thereby the first to present evidence that comparative research has overestimated the vocational specificity of educational systems on young people's employment chances by not taking into account the variation *between* educational programs *within* a country. As a matter of fact, the vocational specificity of educational programs seems to be more important in explaining young people's employment chances than the aggregate vocational specificity of educational systems. Instead of applying micro-explanations at aggregated levels, future research can add to current understandings by providing more accurate estimations of the contributions of these mechanisms at the level of which they are thought to be at play (see also Blommaert et al., 2020; DiPrete et al., 2017; Raffe, 2014).

Moving to our second research question, which was: T*o what extent does the vocational impact of educational programs vary with the macro-economic conditions of countries?* Our findings show that only with regard to young people's employment chances, the impact of the vocational specificity of educational programs varies with aggregate unemployment rates. While the specificity of programs in general increases young people's employment chances in countries, this positive relation weakens in countries where unemployment rates are higher. This suggests that young people from more specific educational programs generally have better employment chances, but the relative advantage they have compared to those from less specific programs is smaller in countries with poorer macro-economic conditions (Coenen et al., 2015; Korpi et al., 2003).

Two limitations of our study should be mentioned. First, our data did not allow a more accurate measurement of the local linkage score (M_g). Previous micro-studies had access to more detailed information on individuals' educational and occupational level (ISCED and ISCO at the three-digit level), whereas we only had similar detailed information on occupations. However, as our linkage measurement may have been able to less accurately cluster school-leavers from the same educational programs in a set of occupations, our findings would arguably only provide an underestimation of the effects of the vocational specificity of educational programs on young people's employment chances.

Second, we were only able to investigate 19 countries with the information we had at hand from PIAAC. Our selection of countries was probably not random out of 32 available countries. Moreover, a quarter these countries are from Central and Eastern Europe, which are known to have different developments and features in their institutions from western industrialized countries because of their socialist past and the choices they have made after this period (Saar, Unt, & Kogan, 2008). This composition of countries has of course influenced our findings. A potential direction for future comparative research is to investigate these vocational effects (at both levels) on a larger number of countries, which may be possible with the Labor Force Survey data. Nonetheless, we preferred the PIAAC data as it allowed us to control for key cognitive skills, such as literacy and numeracy skills.

All in all, the present study has demonstrated that by overemphasizing institutional homogeneity in the vocational specificity of educational systems, the current literature has inaccurately estimated the contributions of the vocational specificity of educational programs on young people's employment chances, both empirically and theoretically. In fact, the lesson to be drawn from this study is that the role of vocational specificity in school-to-work transitions is predominantly present at the level of educational programs rather than at the level of educational systems. The implications of this finding for the theoretical mechanisms (i.e. human capital, signaling, network mechanisms) underlying the effect of vocational specificity on youth labor market integration is food for future research. In order to improve our current understandings, an important avenue for future studies is thus to include the vocational specificity of educational programs in order to accurately capture the vocational impact at both levels.

Notes

1 The following countries were thus excluded from our sample: (a) Australia, (b) Canada and Estonia, (c) Cyprus, Singapore, and the United States of America, and (d) Chile, Israel, Japan, Korea, New Zealand, Russia, and Turkey.

2 The eight fields of education were: "General programs", "Teacher training and education science", "Humanities, languages and arts", "Social sciences, business and law", "Science, mathematics and computing", "Engineering, manufacturing and construction", "Agriculture and veterinary", "Health and welfare", and "Services".

3 The data we used were not available for all countries in 2012 or 2015. It was therefore inevitable that information from different years were sometimes used. Following Bol and Van de Werfhorst (2013), we used the data that were closest to the corresponding survey years, which was not more than three years away.

4 This is a common approach in the literature (see Hanushek, Schwerdt, Wiederhold, & Woessmann, 2015; Verhaest et al., 2018).

References

Aigner, D. J., & Cain, G. C. (1977). Statistical theories of discrimination in labor markets. *Industrial and Labor Relations Review 30*, 175–187.

Ainsworth, J. W., & Roscigno, V. J. (2005). Stratification, school–work linkages and vocational education. *Social Forces, 84*, 257–284.

Allen, J. P., & van der Velden, R. K. W. (2012). Skills for the 21st century: implications for education. METEOR, Maastricht University School of Business and Economics (METEOR Research Memorandum No. 043 https://doi.org/10.26481/umamet.2012043

Allmendinger, J. (1989). Educational systems and labor market outcomes. *European sociological review, 5*(3), 231-250.

Andersen, R., & Van de Werfhorst, H. G. (2010). Education and occupational status in 14 countries: The role of educational institutions and labour market coordination. *The British journal of sociology, 61*(2), 336–355.

Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist, 55*, 469.

Arrow, K. J. (1973). Higher education as a filter. Journal of Public Economics 2(3), 193–216.

Arum, R., & Shavit, Y. (1995). Secondary vocational education and the transition from school to work. *Sociology of Education*, 187–204.

Barbieri, P., Cutuli, G., & Passaretta, G. (2016). Institutions and the school-to-work transition: disentangling the role of the macro-institutional context. *Socio-Economic Review, 16*(1), 161–183.

Barone, C., & Schizzerotto, A. (2011). Introduction: Career mobility, education and intergenerational reproduction in five European countries. *European Societies, 13*, 331–345.

Barone, C., & Van de Werfhorst H.G. (2011) Education, cognitive skills and earnings in comparative perspective. *International Sociology 26*(4), 483–502.

Becker, G. S. (1964). *Human capital: A theoretical and empirical analysis with special reference to education*. New York: Columbia University Press.

Bills, D. B. (2003). Credentials, signals, and screens: Explaining the relationship between schooling and job assignment. *Review of Educational Research, 73*(4), 441–449.

Bills, D. B., & Wacker, M. E. (2003). Acquiring credentials when signals don't matter: Employers' support of employees who pursue postsecondary vocational degrees. *Sociology of Education, 76*, 170–187.

Bishop, J. H. (1995). Vocational education and at-risk youth in the United States. *Vocational Training European Journal, 6*, 34–42.

Blommaert, L., Muja, A., Gesthuizen, M., & Wolbers, M. H. (2020). The Vocational specificity of educational systems and youth labour market integration: A literature review and meta-analysis. *European Sociological Review, 36*(5), 720-740.

Blossfeld, H. P. (1992). Is the German dual system a model for a modern vocational training system?. *International Journal of Comparative Sociology, 33*(3), 168.

Bol, T., Ciocca Eller, C., van de Werfhorst, H. G., & DiPrete, T. A. (2019). School-to-work linkages, educational mismatches, and labor market outcomes. *American Sociological Review, 84*(2), 275–307.

Bol, T., & Van de Werfhorst, H. G. (2011). Signals and closure by degrees: The education effect across 15 European countries. *Research in Social Stratification and Mobility, 29*(1), 119–132.

Bol, T., & Van de Werfhorst, H. G. (2013). Educational systems and the trade-off between labor market allocation and equality of educational opportunity. *Comparative Education Review, 57*(2), 285–308.

Bol, T., & Weeden, K. A. (2015). Occupational closure and wage inequality in Germany and the United Kingdom. *European Sociological Review, 31*(3), 354–369.

Borghans, L., & De Grip, A. (1999). *Skills and low pay: upgrading or overeducation?* No.005. Maastricht: Research Centre for Education and the Labour Market.

Borghans, L., & De Grip, A. (2000). *The Overeducated Worker? The Economics of Underutilization of Skills.* Cheltenham: Edward Elgar Publishing.

Borghans, L., & Heijke, H. (2005). The production and use of human capital: Introduction. *Education Economics, 13*(2), 133–142.

Breen, R. (2005). Explaining cross-national variation in youth unemployment: Market and institutional factors. *European Sociological Review, 21*(2), 125–134.

Brunello, G., & Checchi, D. (2007). Does school tracking affect equality of opportunity? New international evidence. *Economic policy, 22*(52), 782-861.

Brzinsky-Fay, C. (2017). The interplay of educational and labour market institutions and links to relative youth unemployment. *Journal of European Social Policy, 27*(4), 346–359.

Bynner, J. (2005). Rethinking the youth phase of the life-course: The case for emerging adulthood? *Journal of Youth Studies, 8*, 367–384.

Coenen, J., Heijke, H., & Meng, C. (2015). The labour market position of narrow versus broad vocational education programmes. *Empirical Research in Vocational Education and Training, 7*(9). DOI 10.1186/s40461-015-0020-x

Collins, R. (1979). *The credential society: An historical sociology of education and stratification.* Columbia University Press.

Daymont, T. N., & Andrisani, P. J. (1984). Job preferences, college major, and the gender gap in earnings. *Journal of Human Resources 19*, 408–28.

De Grip, A., & Wolbers, M. H. J. (2006). Cross-national differences in job quality among low-skilled young workers in Europe. *International Journal of Manpower, 27*, 420–433.

De Lange, M., Gesthuizen, M., & Wolbers, M. H. J. (2014). Youth labor market integration across Europe: The impact of cyclical, structural and institutional characteristics. *European Societies, 16*, 194–212.

Dieckhoff, M. (2008). Skills and occupational attainment: a comparative study of Germany, Denmark and the UK. *Work, Employment and Society, 22*(1), 89–108.

DiPrete, T. A., Eller, C. C., Bol, T., & van de Werfhorst, H. G. (2017). School-to-work linkages in the United States, Germany, and France. *American Journal of Sociology, 122*(6), 1869–1938.

Di Stasio, V. (2017). 'Diversion or safety net?' Institutions and public opinion on vocational education and training. *Journal of European Social Policy, 27*(4), 360–372.

Di Stasio, V., & Van de Werfhorst, H. G. (2016). Why does education matter to employers in different institutional contexts? A vignette study in England and the Netherlands. *Social Forces, 95*(1), 77–106.

Dronkers, J. (1993). The precarious balance between general and vocational education in the Netherlands. *European Journal of Education, 28*, 197–207.

Figlio, D., & Page, M. (2002). School choice and the distributional effects of ability tracking: Does separation increase inequality? *Journal of Urban Economics, 51*, 497–514.

Forster, A. G., & Bol, T. (2018). Vocational education and employment over the life course using a new measure of occupational specificity. *Social Science Research, 70*, 176–197.

Forster, A. G., Bol, T., & Van de Werfhorst, H. G. (2016). Vocational education and employment over the life cycle. *Sociological Science, 3*, 473–494.

Gangl, M. (2001). European patterns of labor market entry. A dichotomy of occupationalized versus non-occupationalized systems. *European Societies, 3*, 471–494.

Gebel, M., & Giesecke, J. (2016). Does deregulation help? The impact of employment protection reforms on youths' unemployment and temporary employment risks in Europe. *European Sociological Review, 32*, 486–500.

Gesthuizen, M., Solga, H., & Künster, R. (2011). Context matters: Economic marginalization of low-educated workers in cross-national perspective. *European Sociological Review, 27*(2), 264-280.

Glebbeek, A. (1988). De arbeidsmarktpositie van opleidingen. Ontwikkeling en illustratie van een theoretisch model. *Tijdschrift voor Arbeidsvraagstukken, 4*, 75–89.

Glebbeek, A., Wim, N., & Schakelaar, R. (1989). The labor-market position of Dutch sociologists–an investigation guided by a theoretical model. *Netherlands Journal of Social Sciences, 25*, 57–74.

Hampf, F., & Woessmann, L. (2017). Vocational vs. general education and employment over the life cycle: New evidence from PIAAC. *CESifo Economic Studies, 63*(3), 255–269.

Hannan, D., Raffe, D., & Smyth, E. (1997). Cross-national research on school to work transitions: an analytic framework. In *Youth transitions in Europe: theory and evidence*, edited by Wequin, P., Breen, R., & Planas, J. 409–442. Marseilles: CEREQ.

Hanushek, E. A., & Woessmann, L. (2005). Does educational tracking affect performance and inequality? Differences-in-differences evidence across countries. *Economic Journal, 116*, 63–76.

Hanushek, E. A., Woessmann, L., & Zhang, L. (2011). *General education, vocational education, and labor-market outcomes over the life-cycle*. Working paper no. 17504. New York: National Bureau of Economic Research.

Hanushek, E. A., Schwerdt, G., Wiederhold, S., & Woessmann, L. (2015). Returns to skills around the world: Evidence from PIAAC. *European Economic Review, 73*, 103–130.

Hanushek, E. A., Schwerdt, G., Woessmann, L., & Zhang, L. (2017). General education, vocational education, and labor-market outcomes over the lifecycle. *Journal of Human Resources, 52*(1), 48–87.

Heijke, H., Meng, C., & Ris, C. (2003). Fitting to the job: the role of generic and vocational competencies in adjustment and performance. *Labor Economics, 10*, 215–229.

Heisig, J. P., & Solga, H. (2015). Secondary educational systems and the general skills of less- and intermediate-educated adults. A comparison of 18 countries. *Sociology of Education, 8*, 202–225.

Hoffman, N. (2011). *Schooling in the Workplace: How Six of the World's Best Vocational Education Systems Prepare Young People for Jobs and Life*. Cambridge, Mass.: Harvard Education Press.

Iannelli, C., & Raffe, D. (2007). Vocational upper-secondary education and the transition from school. *European Sociological Review, 23*(1), 49–63.

Kalmijn, M., & Van der Lippe, T. (1997). Type of schooling and sex differences in earnings in the Netherlands. *European Sociological Review, 13*, 1–15.

Kerckhoff, A. (1995). Institutional arrangements and stratification processes in industrial societies. *Annual Review of Sociology, 15*, 323–47.

Kerckhoff, A. (2001). Education and social stratification processes in comparative perspective. *Sociology of Education, Extra issue*, 3–18.

Klein, M. (2010). *Mechanisms for the effect of field of study on the transition from higher education to work*. Working paper no. 2010/130. Mannheim: Mannheimer Zentrum für Europäische Sozialforschung.

Kocer, R. G., & Van de Werfhorst, H. G. (2012). Educational systems and the formation of societal consensus on justice. *Quality and Quantity, 46*, 451–470.

Korpi, T., De Graaf, P., Hendrickx, J., & Layte, R. (2003). Vocational training and career employment precariousness in Great Britain, the Netherlands and Sweden. *Acta Sociologica, 46*(1), 17–3.

Lancee, B., & Bol, T. (2017). The transferability of skills and degrees: Why the place of education affects immigrant earnings. *Social Forces, 96*(2), 691–716.

Lazear, E. P. (2009). Firm-specific human capital: A skill-weights approach. *Journal of Political Economy, 117*(5), 914–940.

Lerman, R. I. (2009). *Training tomorrow's workforce: Community college and apprenticeship as collaborative routes to rewarding careers*. Washington, DC: Center for American Progress.

Levels, M., Van der Velden, R. K. W., & Di Stasio, V. (2014). From school to fitting work: How education-to-job matching of European school leavers is related to educational system characteristics. *Acta Sociologica, 57*(4), 341–361.

Levy, F. (2010). *How technology changes demands for human skills* (OECD Working Paper, No. 45). http://dx.doi.org/10.1787/5kmhds6czqzq-en

Marsden, D. (1999). *A theory of employment systems: Micro-foundations of societal diversity*. Oxford: Oxford University Press.

Maurice, M., Sellier, F., & Silvestre, J. J. (1986). *The social foundations of industrial power: A comparison of France and Germany*. Cambridge, MA: MIT Press.

Ministry of Education Culture and Science. (2016). *Key Figures Education*. The Hague: Rijksoverheid. Retrieved from https://www.ocwincijfers.nl/documenten/publicaties/2016/05/31/key-figures-education

Meng, C. (2006). *Discipline-specific or academic? Acquisition, Role and Value of Higher Education Competencies* (dissertation). Maastricht: Research Centre for Education and the Labor Market (ROA).

Mora, R., & Ruiz-Castillo, J. (2011). Entropy-based Segregation Indices. *Sociological Methodology, 41*(1), 159–194.

Müller, W. (2005). Education and youth integration into European labor markets. *International Journal of Comparative Sociology, 46*, 461–485.

Müller, W., & Gangl, M. (eds.) (2003). *Transitions from education to work in Europe. The integration of youth into EU Labor Markets*. Oxford: Oxford University Press.

Noelke, C. (2015). Employment protection legislation and the youth labor market. *European Sociological Review, 32*(4), 471–485.

OECD. (2013). *PISA 2012 Results (Volume IV): What Makes Schools Successful? Resources, Policies and Practices*. Paris: OECD.

OECD. (2014). *Education at a Glance, 2014*. Paris: OECD.

OECD. (2016a). *Netherlands 2016: Foundations for the future, reviews of national policies for education*. Paris: OECD.

OECD. (2016b). *PISA 2015 Results (Volume II): Policies and Practices for Successful Schools*. Paris: OECD.

OECD. (2017). *Education at a Glance, 2017*. Paris: OECD.

Paglin, M., & Rufolo, A. (1990). Heterogeneous human capital, occupational choice, and male-female earnings differences. *Journal of Labor Economics, 8*, 123–44.

Pfeffer, F. T. (2008). Persistent inequality in educational attainment and its institutional context. *European Sociological Review, 24*, 543–565.

Pfeffer, F. T. (2015). Equality and quality in education: A comparative study of 19 countries. *Social Science Research, 51*, 350–368.

Protsch, P. (2017). Getting a foot in the door: How organisational characteristics shape recruitment decisions in the dual apprenticeship system. *Journal of Education and Work, 30*(6), 585–598.

Protsch, P., & Solga, H. (2015). How employers use signals of cognitive and noncognitive skills at labour market entry: Insights from field experiments. *European Sociological Review, 31*(5), 521–532.

Protsch, P., & Solga, H. (2016). The social stratification of the German VET system. *Journal of Education and Work, 29*(6), 637–661.

Raffe, D. (2008). The concept of transition system. *Journal of Education and Work, 21*(4), 277–296.

Raffe, D. (2014). Explaining national differences in education-work transitions: twenty years of research on transition systems. *European Societies, 16*(2), 175–193.

Reimer, D., Noelke, C., & Kucel, A. (2008). Labor market effects of field of study in comparative perspective: An analysis of 22 European countries. *International Journal of Comparative Sociology, 49*(4–5), 233–256.

Reimer, D., & Steinmetz, S. (2007). *Gender differentiation in higher education: Educational specialization and labor market risks in Spain and Germany*. Working paper no. 2007/99. Mannheim: Mannheimer Zentrum für Europäische Sozialforschung.

Rosenbaum, J. E., Kariya, T., Settersten, R., & Maier, T. (1990). Market and network theories of the transition from high school to work: Their application to industrialized societies. *Annual review of sociology, 16*(1), 263–299.

Rözer, J., & Bol, T. (2019). Labour market effects of general and vocational education over the life-cycle and across time: accounting for age, period, and cohort effects. *European Sociological Review, 35*(5), 701–717.

Rözer, J., & Van de Werfhorst, H. G. (2020). Three worlds of vocational education: specialized and general craftmanship in France, Germany, and The Netherlands. *European Sociological Review*, jcaa025, https://doi.org/10.1093/esr/jcaa025

Ryan, P. (2000). The attributes and institutional requirements of apprenticeship: Evidence from smaller EU countries. *International Journal of Training and Development, 4*, 42–65.

Ryan, P. (2001). The school-to-work transition: A cross-national perspective. *Journal of Economic Literature, 39*, 34–92.

Saar, E., Unt, M., & Kogan, I. (2008). Transition from educational system to labour market in the European Union: A comparison between new and old members. *International journal of comparative sociology, 49*(1), 31-59.

Scherer, S. (2004). Stepping-stones or traps? The conseuqnces of labour market entry position on future careers in West Germany, Great Britain, and Italy. *Work, Employment and society 18*(2), 369–394.

Scherer, S. (2005). Patterns of labour market entry - long wait or career instability? An empirical comparison of Italy, Great Britain and West Germany. *European Sociological Review, 21*(5), 427–440.

Schultz, T. W. (1961). Investment in human capital. *American Economic Review, 51*, 1–17.

Shavit, Y., & Müller, W. (eds.) (1998). *From school to work. A comparative study of educational qualifications and occupational destinations*. Oxford: Oxford University Press.

Shavit, Y., & Müller, W. (2000). Vocational secondary education: Where diversion and where safety net? *European Societies, 2*, 29–50.

Smyth, E. (2005). Gender differentiation and early labor market integration across Europe. *European Societies, 7*, 451–79.

Spence, M. (1973). Job market signaling. *The Quarterly Journal of Economics, 87*(3), 355–374.

Statistics Netherlands (CBS). (2016). Accessed 27 August 2019. https://opendata.cbs.nl/statline/#/CBS/nl/dataset/83360NED/table?dl=254FA

Statistics Netherlands (CBS). (2018a). *Migration Background*. Accessed 3 March 2019. https://www.cbs.nl/en-gb/our-services/methods/definitions?tab=m#id=migration0-background

Statistics Netherlands (CBS). (2018b). *Regional labor market situation of young people aged 15 to 27*. Den Haag/Heerlen: CBS. Accessed 3 March 2019. http://statline.cbs.nl/Statweb/publication/?VW=T&DM=SLNL&PA=83663NED&D1=0&D2=l&D3=0,2&D4=0&D5=0&D6=18-57&D7=5-10&HD=190320-1053&HDR=T,G6,G1,G2&STB=G5,G3,G4

Thurow, L. C. (1975). *Generating inequality*. New York: Basic books.

Van der Meijden, A., Van den Berg, J., & Román, A. (2013). *Ontwerp en resultaat van opleidingen in het middelbaar beroepsonderwijs. Vijfde meting van de CGO monitor.* 's-Hertogenbosch: Expertisecentrum Beroepsonderwijs.

Van der Velden, R. K. W. (2011a). Generiek of specifiek opleiden? *Tijdschrift voor Arbeidsvraagstukken 27*(3), 382–397.

Van der Velden, R. K. W. (2011b). De effecten van betrouwbaarheid van onderwijsdiploma's op arbeidsproductiviteit. In J. Dronkers (ed.), *Goede bedoelingen in het onderwijs. Kansen en missers* (pp. 27-49). Amsterdam: Amsterdam University Press.

Van der Velden, R. K. W., & Wolbers, M. H. J. (2003). The integration of young people into the labor market: The role of training systems and labor market regulation. In W. Müller & M. Gangl (eds.), *Transitions from education to work in Europe. The integration of youth into EU Labor Markets* (pp. 186–211). Oxford: Oxford University Press.

Van der Velden, R. K. W., & Wolbers, M. H. J. (2007). How much does education matter and why? The effects of education on socio-economic outcomes among school-leavers in the Netherlands. *European Sociological Review, 23*(1), 65–8.

Van de Werfhorst, H. G. (2002). A detailed examination of the role of education in intergenerational social-class mobility. Social Science Information, 41, 407–438.

Van de Werfhorst, H. G. (2004). Systems of educational specialization and labor market outcomes in Norway, Australia, and the Netherlands. *International Journal of Comparative Sociology 45*, 315–35.

Van de Werfhorst, H. G. (2011a). Skill and education effects on earnings in 18 countries: The role of national educational institutions. *Social Science Research, 40*(4), 1078–1090.

Van de Werfhorst, H. G. (2011b). Skills, positional good or social closure? The role of education across structural–institutional labour market settings. *Journal of Education and Work, 24*(5), 521–548.

Van de Werfhorst, H. G. (2014). Changing societies and four tasks of schooling: Challenges for strongly differentiated educational systems. *International Review of Education, 60*, 123–144.

Van de Werfhorst, H. G., & Kraaykamp, G. (2001). Four field-related educational resources and their impact on labor, consumption, and socio-political orientation. *Sociology of Education, 74*, 296–317.

Van de Werfhorst, H. G., & Mijs, J. J. B. (2010). Achievement inequality and the institutional structure of educational systems: A comparative perspective. *Annual Review of Sociology, 36*, 407–28.

Verhaest, D., Lavrijsen, J., Van Trier, W., Nicaise, I., & Omey, E. (2018). General education, vocational education and skill mismatches: short-run versus long-run effects. *Oxford Economic Papers, 70*(4), 974–993.

Verhaest, D., Sellami, S. and Van der Velden, R. (2017). Differences in horizontal and vertical mismatches across countries and fields of study. *International Labour Review, 156*, 1–23.

Vogtenhuber, S. (2014). The impact of within country heterogeneity in vocational specificity on initial job matches and job status. *Journal of Vocational Behavior, 85*(3), 374–384.

Weeden, K. A. (2002). Why do some occupations pay more than others? Social closure and earnings inequality in the United States. *American Journal of Sociology, 108*(1), 55–101.

Weiss, A. (1995). Human capital vs. signalling explanations of wages. *The Journal of Economic Perspective, 9*, 133–154.

Wolbers, M. H. J. (2003). Job mismatches and their labor market effects among school-leavers in Europe. *European Sociological Review, 19*, 249–66.

Wolbers, M. H. J. (2007a). Patterns of labour market entry: A comparative perspective on school-to-work transitions in eleven European countries. *Acta Sociologica, 50*(3), 189–21.

Wolbers, M. H. J. (2007b). Employment insecurity at labor market entry and its impact on parental home leaving and family formation. A comparative study among recent graduates in eight European countries. *International Journal of Comparative Sociology, 48*, 481–507.

Wolbers, M. H. J. (2014). Introduction. Research on school-to-work transitions in Europe. *European Societies, 16*, 167–174.

Xu, Y. J. (2013). Career outcomes of STEM and non-STEM college graduates: Persistence in majored-field and influential factors in career choices. R*esearch in Higher Education, 54*, 349–382.

Appendices

APPENDIX A

Table A.1 | Correlation matrix of self-rated skills and objective indicators.

	Self-rated specific skills Pearson's correlation *r*	**Self-rated generic skills** Pearson's correlation *r*
Self-rated specific skills		
Self-rated generic skills	.412***	
VET track (ref. = school-based)	.066***	-.009
Apprenticeship (ref. = no)	.119***	.014
Educational level VET (ref. = lowest)	.028*	.111***
Average graduation grade	.144***	.196***

*Source: VET survey 2015; N = 6,014. *** p <0.001, ** p<0.01, * p <0.05, ~ p <0.10 (two-tailed).*

Table A.2 | Linear regression models of school-leavers' self-rated specific and generic skills.

	Self-rated specific skills		**Self-rated generic skills**	
	B	SE	B	SE
Four objective indicators				
VET track (school-based = ref.)				
Work-based track	0.092***	0.021	0.054*	0.022
Apprenticeship at firm (no = ref.)				
Yes	0.121***	0.016	0.004	0.017
Missing	0.269*	0.124	0.092	0.129
VET level (2 = ref.)				
Level 3	0.061*	0.027	0.091***	0.028
Level 4	0.066**	0.026	0.175***	0.027
Average grad. Grade				
Controls				
Educational sector				
Economics = ref.	0.156***	0.015	0.223***	0.015
Agriculture	-0.009	0.036	-0.132***	0.037
Technology	0.034	0.024	-0.098***	0.025
Health care	0.169***	0.022	-0.014	0.023
Social work	0.075**	0.028	-0.063*	0.029
Female (male = ref.)	-0.043*	0.020	0.055**	0.021
Age	0.001**	0.005	0.000	0.005
Ethnic background				
Native Dutch = ref.				
Western	-0.001	0.039	0.020	0.041
Non-western	0.091**	0.034	0.136***	0.035
Missing				
Parental educational background				
Elementary = ref.	-0.026	0.103	-0.035	0.106
Lower secondary	-0.096	0.063	0.009	0.066
Upper sec. gen.	-0.081	0.069	-0.021	0.071
Upper sec. VET	-0.089	0.062	-0.031	0.065
Tertiary	-0.073	0.063	0.011	0.065
Missing	-0.103	0.068	-0.021	0.070
Intercept	2.601***	0.150	2.028***	0.156

*Source: VET survey 2015; N = 6,014. *** p <0.001, ** p<0.01, * p <0.05, ~ p <0.10 (two-tailed).*

Table B.1 | Robustness check **main effects**: cross-classified models with **average** and **yearly** regional unemployment rate (logit effects).

	Total Sample		**Employed Sample**					
	Paid job		Immediate entry		Horizontal match		Vertical match	
	Averaged	Yearly	Averaged	Yearly	Averaged	Yearly	Averaged	Yearly
	b (SE)	b (SE)	b (SE)	b (SE)	b (SE)	b (SE)	b (SE)	b (SE)
Program level								
Skill vocational specificity	0.028	0.026	0.084~	0.084~	0.175*	0.174*	0.084	0.083
	(0.048)	(0.048)	(0.049)	(0.049)	(0.072)	(0.072)	(0.058)	(0.058)
Apprentice vocational specificity	0.297***	0.295***	0.238***	0.238***	0.376***	0.374***	0.136*	0.130*
	(0.054)	(0.054)	(0.054)	(0.054)	(0.076)	(0.076)	(0.060)	(0.060)
Region level								
Regional youth unemployment rate	-0.106**	-0.153***	-0.040	-0.049~	-0.043	-0.064*	0.009	0.001
	(0.039)	(0.037	(0.027)	(0.026)	(0.032)	(0.030)	(0.023)	(0.024)
Intercept	1.694***	1.215***	1.174***	1.025***	0.204	-0.120	0.675***	0.354~
	(0.189)	(0.151)	(0.177)	(0.159)	(0.237)	(0.224)	(0.199)	(0.182)
N regions / N regions-years	39	191	39	191	39	191	39	191
N programs	114	114	114	114	114	114	114	114
Variance unemployment rate	0.005	0.006	0.001	0.000	0.089	0.008	0.001	0.001
	(0.072)	(0.074)	(0.030)	(0.009)	(0.130)	(0.087)	(0.024)	(0.032)
Variance region level	0.018	0.044	0.003	0.008	0.008	0.009	0.000	0.000
	(0.134)	(0.209)	(0.057)	(0.092)	(0.087)	(0.097)	(0.000)	(0.014)
Variance program level	0.193	0.191	0.236	0.236	0.670	0.670	0.406	0.405
	(0.439)	(0.437)	(0.486)	(0.485)	(0.818)	(0.819)	(0.637)	(0.637)
Log likelihood	-5,015.1	-5,030.2	-5,543.4	-5,551.5	-5,980.5	-5,994.8	-6,018.4	-6,033.3

Note. Only main findings are shown.

*Source: VET survey 2011-2015 and VET expert survey 2011. ~ p <0.10; * p <0.05; ** p <0.01; *** p <0.001 (two-tailed).*

Table B.2 | Robustness check **interactions**: cross-classified models with **average** regional unemployment rate (logit effects).

	Total Sample		**Employed Sample**					
	Paid job		Immediate entry		Horizontal match		Vertical Match	
	M1	M2	M1	M2	M1	M2	M1	M2
	b (SE)	b (SE)	b (SE)	b (SE)	b (SE)	b (SE)	b (SE)	b (SE)
Program level								
Skill vocational specificity	0.033	0.027	0.086*	0.086*	0.175*	0.174*	0.085	0.084
	(0.048)	(0.048)	(0.049)	(0.049)	(0.072)	(0.174)	(0.058)	(0.058)
Apprentice vocational specificity	0.297***	0.307***	0.238***	0.240***	0.376***	0.382***	0.136*	0.139*
	(0.054)	(0.055)	(0.054)	(0.054)	(0.076)	(0.076)	(0.060)	(0.060)
Skill vocational*unemployment	0.027		-0.008		0.000		0.002	
	(0.026)		(0.023)		(0.024)		(0.022)	
Apprentice vocational*unemployment		0.038		-0.019		0.035		0.012
		(0.031)		(0.027)		(0.028)		(0.023)
Region level								
Average Regional youth unemployment rate	-0.103**	-0.100*	-0.041	-0.043	-0.043	-0.037	0.010	0.010
	(0.039)	(0.039)	(0.027)	(0.027)	(0.032)	(0.033)	(0.024)	(0.024)
Intercept	1.697***	1.694***	1.175***	1.172***	0.204	0.206	0.675***	0.676***
	(0.190)	(0.190)	(0.177)	(0.178)	(0.237)	(0.237)	(0.199)	(0.199)
N regions	39	39	39	39	39	39	39	39
N programs	114	114	114	114	114	114	114	114
Variance unemployment rate	0.004	0.005	0.001	0.001	0.008	0.009	0.001	0.001
	(0.065)	(0.073)	(0.031)	(0.029)	(0.089)	(0.097)	(0.024)	(0.023)
Variance region level	0.018	0.018	0.003	0.003	0.008	0.008	0.000	0.000
	(0.135)	(0.134)	(0.057)	(0.057)	(0.087)	(0.087)	(0.000)	(0.000)
Variance program level	0.194	0.195	0.236	0.237	0.670	0.671	0.405	0.406
	(0.441)	(0.4421)	(0.486)	(0.487)	(0.818)	(0.819)	(0.637)	(0.637)
Log likelihood	-5,014.6	-5,014.4	-5,543.3	-5,543.1	-5,980.5	-5,979.7	-6,018.4	-6,018.3

Note. Only main findings are shown.

*Source: VET survey 2011-2015 and VET expert survey 2011; total sample N = 15,571; employed sample N = 11,678. *** p <0.001; ** p <0.01; *p <0.05; ~ p <0.10 (two-tailed).*

Table B.3 | Robustness check **interactions**: cross-classified models with **yearly** regional unemployment rate (logit effects).

	Total Sample		**Employed Sample**					
	Paid job		Immediate entry		Horizontal match		Vertical match	
	M1	M2	M1	M2	M1	M2	M1	M2
	b (SE)	b (SE)	b (SE)	b (SE)	b (SE)	b (SE)	b (SE)	b (SE)
Program level								
Skill vocational specificity	0.030	0.025	0.085*	0.085*	0.173*	0.172*	0.084	0.082
	(0.048)	(0.048)	(0.049)	(0.049)	(0.072)	(0.072)	(0.058)	(0.058)
Apprentice vocational specificity	0.294***	0.301***	0.238***	0.238***	0.374***	0.380***	0.130*	0.130*
	(0.054)	(0.055)	(0.054)	(0.054)	(0.076)	(0.076)	(0.060)	(0.060)
Skill vocational*unemployment	0.026		-0.010		-0.003		0.005	
	(0.026)		(0.023)		(0.024)		(0.022)	
Apprentice vocational*unemployment		0.028		-0.026		0.033		0.016
		(0.031)		(0.026)		(0.028)		(0.023)
Region level								
Yearly regional youth unemployment rate	-0.151***	-0.149***	-0.049~	-0.052*	-0.064*	-0.057~	0.001	0.002
	(0.037)	(0.037)	(0.026)	(0.026)	(0.030)	(0.030)	(0.024)	(0.024)
Intercept	1.217***	1.215***	1.025***	1.022***	-0.121	-0.118	0.354~	0.355~
	(0.151)	(0.151)	(0.159)	(0.159)	(0.224)	(0.224)	(0.182)	(0.182)
N region-years	191	191	191	191	191	191	191	191
N programs	114	114	114	114	114	114	114	114
Variance yearly regional unemployment rate	0.005	0.006	0.000	0.000	0.007	0.009	0.001	0.001
	(0.068)	(0.075)	(0.010)	(0.007)	(0.086)	(0.096)	(0.031)	(0.030)
Variance region level	0.044	0.044	0.008	0.008	0.009	0.009	0.000	0.000
	(0.209)	(0.209)	(0.092)	(0.092)	(0.097)	(0.096)	(0.012)	(0.014)
Variance program level	0.193	0.193	0.236	0.238	0.670	0.671	0.405	0.405
	(0.439)	(0.439)	(0.486)	(0.487)	(0.819)	(0.819)	(0.636)	(0.636)
Log likelihood	-5,029.7	-5,029.8	-5,551.4	-5,551.0	-5,994.8	-5,994.0	-6,033.3	-6,033.1

Note. Only main findings are shown.

*Source: VET survey 2011-2015 and VET expert survey 2011; total sample N = 15,571; employed sample N = 11,678. *** p <0.001; ** p <0.01; *p <0.05; ~ p <0.10 (two-tailed).*

Table B.4 | Results of **main effects** logistic **2-level** models of school-leavers' labor market chances (logit effects).

	Total Sample		**Employed sample**					
	Paid job		Immediate entry		Horizontal match		Vertical match	
	b	(SE)	b	(SE)	b	(SE)	b	(SE)
Program level								
Skill vocational specificity	0.035	(0.048)	0.082~	(0.049)	0.176*	(0.072)	0.085	(0.058)
Apprentice vocational specificity	0.313***	(0.055)	0.244***	(0.054)	0.380***	(0.075)	0.138*	(0.060)
VET level (level 2 = ref.)								
Level 3	0.864***	(0.162)	0.606***	(0.168)	0.776**	(0.243)	0.021	(0.195)
Level 4	1.111***	(0.153)	0.637***	(0.159)	0.931***	(0.231)	0.715***	(0.188)
Educational sector (economics = ref.)								
Agriculture	0.136	(0.317)	0.035	(0.325)	-0.331	(0.466)	-0.219	(0.378)
Technology	0.380**	(0.141)	0.017	(0.144)	0.370~	(0.207)	0.147	(0.169)
Health	0.703***	(0.162)	0.426*	(0.167)	0.764**	(0.255)	0.655**	(0.204)
Social work	-0.205	(0.206)	-0.569**	(0.215)	-0.390	(0.335)	-0.111	(0.266)
Individual level								
Female (male = ref.)	0.009	(0.073)	-0.101	(0.071)	0.056	(0.067)	0.009	(0.066)
Age	-0.249***	(0.026)	-0.173***	(0.025)	-0.011	(0.025)	0.040	(0.025)
Migration background (Native Dutch = ref.)								
Western	-0.310**	(0.114)	-0.106	(0.114)	-0.068	(0.109)	-0.433***	(0.104)
Non-western	-0.968***	(0.072)	-0.585***	(0.085)	-0.355***	(0.086)	-0.299***	(0.087)
Parental educational background (low = ref.)								
Intermediate	0.070	(0.070)	0.048	(0.064)	0.086	(0.060)	0.182**	(0.059)
Higher	-0.083	(0.076)	-0.129~	(0.069)	0.075	(0.066)	0.154*	(0.066)
Missing	0.412***	(0.093)	-0.121	(0.104)	-0.066	(0.099)	0.135	(0.099)
Average graduation grade	0.063*	(0.026)	0.071**	(0.025)	0.104***	(0.024)	0.158***	(0.024)
Specific skills			0.208***	(0.026)	0.376***	(0.025)	0.212***	(0.025)
Generic skills			-0.054*	(0.027)	-0.194***	(0.026)	-0.105***	(0.025)
Graduation year (2010 = ref.)								
2011	-0.290~	(0.159)	0.077	(0.128)	-0.101	(0.118)	-0.163	(0.120)
2012	-0.521***	(0.122)	-0.231*	(0.093)	-0.402***	(0.089)	-0.436***	(0.090)
2013	-0.871***	(0.145)	-0.288*	(0.122)	-0.437***	(0.117)	-0.337**	(0.118)
2014	-0.592***	(0.123)	-0.106	(0.095)	-0.382***	(0.090)	-0.287**	(0.092)
Intercept	1.760***	(0.186)	1.163***	(0.178)	0.220	(0.235)	0.681***	(0.199)
N regions	2,478		2,260					
N programs	114		114					
Variance program level	0.197	(0.444)	0.235	(0.485)	0.668	(0.818)	0.404	(0.635)
Log likelihood	-5,033.8		-5,545.7		-5,984.7		-6,018.9	

*Source: VET survey 2011-2015 and VET expert survey 2011; total sample N = 15,571; employed sample N = 11,678. *** p <0.001; ** p <0.01; *p <0.05; ~ p <0.10 (two-tailed).*

Table B.5 | Results of **separate** logistic **3-level** models of **vocational skill measurement** on school-leavers' labor market chances (logit effects).

	Total Sample		Employed sample					
	Paid job		Immediate entry		Horizontal match		Vertical match	
	b	(SE)	b	(SE)	b	(SE)	b	(SE)
Program level								
Skill vocational specificity	0.079	(0.053)	0.130*	(0.052)	0.245**	(0.079)	0.111~	(0.058)
VET level (level 2 = ref.)								
Level 3	0.868***	(0.183)	0.538**	(0.180)	0.739**	(0.272)	-0.001	(0.200)
Level 4	0.838***	(0.162)	0.391*	(0.160)	0.575*	(0.246)	0.589**	(0.183)
Educational sector (economics = ref.)								
Agriculture	0.350	(0.353)	0.105	(0.351)	-0.180	(0.524)	-0.124	(0.390)
Technology	0.611***	(0.155)	0.190	(0.149)	0.653**	(0.226)	0.252	(0.168)
Health	0.832***	(0.184)	0.442*	(0.179)	0.790**	(0.288)	0.673**	(0.210)
Social work	0.125	(0.222)	-0.388~	(0.225)	-0.030	(0.374)	0.031	(0.267)
Region level								
Regional youth unemployment rate	-0.105***	(0.032)	-0.048~	(0.025	-0.035	(0.027)	0.005	(0.024)
Individual level								
Female (male = ref.)	-0.004*	(0.075)	-0.109	(0.072)	0.052	(0.068)	-0.001	(0.067)
Age	-0.237***	(0.026)	-0.162***	(0.025)	-0.002	(0.025)	0.043~	(0.025)
Migration background (Native Dutch = ref.)								
Western	-0.291*	(0.115)	-0.102	(0.114)	-0.067	(0.110)	-0.444***	(0.105)
Non-western	-0.938***	(0.073)	-0.582***	(0.085)	-0.357***	(0.088)	-0.312***	(0.088)
Parental educational background (low = ref.)								
Intermediate	0.068	(0.070)	0.051	(0.064)	0.092	(0.060)	0.186**	(0.059)
Higher	-0.090	(0.076)	-0.130~	(0.069)	0.077	(0.067)	0.154*	(0.066)
Missing	0.421***	(0.093)	-0.119	(0.104)	-0.053	(0.100)	0.140	(0.100)
Average graduation grade	0.064*	(0.026)	0.070**	(0.025)	0.104***	(0.024)	0.160***	(0.024)
Specific skills			0.211***	(0.026)	0.383***	(0.026)	0.215***	(0.025)
Generic skills			-0.055*	(0.027)	-0.196***	(0.026)	-0.107***	(0.026)
Graduation year (2010 = ref.)								
2011	-0.266~	(0.160)	0.082	(0.128)	-0.096	(0.120)	-0.169	(0.121)
2012	-0.505***	(0.122)	-0.223*	(0.094)	-0.398***	(0.090)	-0.444***	(0.091)
2013	-0.865***	(0.146)	-0.288*	(0.122)	-0.439***	(0.118)	-0.350**	(0.119)
2014	-0.583***	(0.123)	-0.102	(0.095)	-0.380***	(0.091)	-0.296**	(0.093)
Intercept	1.789***	(0.202)	1.245***	(0.186)	0.309	(0.260)	0.727***	(0.203)
N regions	2,478		2,260					
N programs	114		114					
Variance unemployment rate	0.005	(0.071)	0.001	(0.036)	0.004	(0.061)	0.001	(0.027)
Variance region level	0.013	(0.116)	0.005	(0.071)	0.066	(0.257)	0.034	(0.183)
Variance program level	0.290	(0.539)	0.295	(0.543)	0.873	(0.934)	0.434	(0.658)
Log likelihood	-5,031.7		-5,553.1		-5,990.3		-6,019.0	

*Source: VET survey 2011-2015 and VET expert survey 2011; total sample N = 15,571; employed sample N = 11,678. *** p <0.001; ** p <0.01; *p <0.05; ~ p <0.10 (two-tailed).*

Table B.6 | Three-level **linear probability models** of school-leavers' labor market chances (logit effects).

	Total Sample		**Employed sample**					
	Paid job		Immediate entry		Horizontal match		Vertical match	
	b	SE	b	SE	b	SE	b	SE
Program level								
Skill vocational specificity	0.001	0.005	0.014~	0.008	0.034**	0.013	0.018~	0.010
Apprentice vocational specificity	0.024***	0.005	0.034***	0.008	0.068***	0.013	0.027*	0.010
VET level (level 2 = ref.)								
Level 3	0.094***	0.015	0.091***	0.026	0.123**	0.042	0.001	0.034
Level 4	0.113***	0.015	0.102***	0.025	0.161***	0.040	0.128***	0.033
Educational sector (economics = ref.)								
Agriculture	0.033	0.030	0.009	0.050	-0.069	0.083	-0.036	0.066
Technology	0.036**	0.013	-0.003	0.022	0.063~	0.036	0.026	0.029
Health	0.061***	0.014	0.050*	0.025	0.092*	0.044	0.084*	0.035
Social work	0.001	0.018	-0.093**	0.033	-0.073	0.058	-0.013	0.046
Region level								
Regional youth unemployment rate	-0.013***	0.003	-0.006	0.004	-0.007	0.005	0.001	0.004
Individual level								
Women	-0.001	0.007	-0.016	0.011	0.010	0.012	0.002	0.012
Age	-0.027***	0.003	-0.027***	0.004	-0.001	0.004	0.007~	0.004
Migration Background (Native Dutch = ref.)								
Western	-0.028*	0.012	-0.017	0.018	-0.013	0.019	-0.082***	0.019
Non-western	-0.131***	0.009	-0.107***	0.015	-0.065***	0.016	-0.055***	0.016
Parental Educational Background (low = ref.)								
Intermediate	0.007	0.007	0.007	0.010	0.015	0.010	0.031**	0.010
Higher	-0.007	0.007	-0.019~	0.011	0.012	0.011	0.026*	0.011
Missing	0.041***	0.009	-0.019	0.016	-0.012	0.017	0.024	0.017
Average graduation grade	0.006*	0.003	0.011**	0.004	0.017***	0.004	0.027***	0.004
Specific skills			0.034***	0.004	0.068***	0.004	0.038***	0.004
Generic skills			-0.008*	0.004	-0.034***	0.004	-0.018***	0.004
Graduation year (2010 = ref.)								
2011	-0.019	0.013	0.011	0.018	-0.015	0.019	-0.026	0.019
2012	-0.039***	0.010	-0.033*	0.014	-0.065***	0.015	-0.071***	0.015
2013	-0.075***	0.013	-0.043*	0.018	-0.072***	0.019	-0.054**	0.019
2014	-0.047***	0.010	-0.015	0.014	-0.062***	0.015	-0.046**	0.015
Intercept	0.818***	0.017	0.748***	0.027	0.554***	0.041	0.647***	0.034
N region-programs	2,478		2,260					
N of programs	114		114					
Variance unemployment rate	0.000	0.012	0.000	0.001	0.000	0.000	0.000	0.002
Variance region-program level	0.001	0.023	0.000	0.000	0.000	0.012	0.000	0.000
Variance program level	0.002	0.046	0.005	0.074	0.020	0.143	0.012	0.108
Residual	0.092	0.304	0.151	0.388	0.168	0.409	0.169	0.411
Log likelihood	-3,676.5		-5,589.8		-6,304.6		-6,286.0	

*Source: VET survey 2011-2015 and VET expert survey 2011; total sample N = 15,571; employed sample N = 11,678. *** p <0.001; ** p <0.01; *p <0.05; ~ p <0.10 (two-tailed).*

APPENDIX C

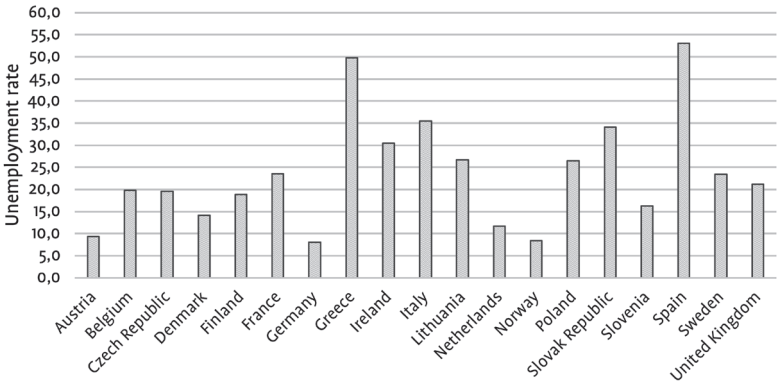

Figure C.1 | Unemployment rate per country

Table C.1 | Results of **logistic** multilevel models of school-leavers' **employment** chances (logit effects).

	Model 1		Model 2	
	b	(se)	b	(se)
Individual level				
Constant	1.651***	(0.131)	1.635***	(0.129)
Cognitive skills				
Numeracy	0.230***	(0.038)	0.230***	(0.038)
Literacy	0.005	(0.037)	0.005	(0.037)
Educational level				
ISCED 3 (ref.)				
ISCED 4	-0.077	(0.115)	-0.089	(0.112)
ISCED 5	0.530***	(0.072)	0.545***	(0.071)
Program level				
Vocational specificity	0.083***	(0.032)	0.104***	(0.038)
Country level				
VET index	0.033	(0.139)	0.038	(0.138)
Unemployment rate	-0.423***	(0.079)	-0.401***	(0.078)
External differentiation	-0.057	(0.107)	-0.055	(0.106)
EPL	0.021	(0.084)	0.018	(0.083)
cross-level interactions				
Specificity*Unemployment			-0.081**	(0.032)
Log likelihood	-8,378		-8,373	

**** p<0.01, ** p<0.05, ~ p<0.1. All models include all individual-level control variables.*

Table C.2 | Results of linear **two-level** models of school-leavers' **gross hourly wages**.

	b	(se)
Individual level		
Constant	1.112***	(0.033)
Cognitive skills		
Numeracy	0.021***	(0.003)
Literacy	0.006**	(0.002)
Educational level		
ISCED 3 (ref.)		
ISCED 4	0.014**	(0.007)
ISCED 5	0.078***	(0.004)
Vocational specificity	0.003**	(0.002)
Country level		
VET index	-0.012	(0.039)
Unemployment rate	-0.059***	(0.021)
External differentiation	-0.058~	(0.031)
EPL	-0.017	(0.024)
Log likelihood	6,107	

**** p<0.01, ** p<0.05, ~ p<0.1. All models include all individual-level control variables.*

Nederlandse samenvatting

De overgang van school naar werk is een belangrijke fase in het leven van jongvolwassenen. Een succesvolle overgang is niet alleen cruciaal voor de eerste én latere stappen op de arbeidsmarkt, maar is ook gerelateerd aan andere transities in deze levensfase, zoals het uit huis gaan en het vormen van een eigen gezin. Een van de kerntaken van het onderwijs is daarom studenten zo goed mogelijk klaar te stomen voor en toe te leiden naar de arbeidsmarkt. De beroepsspecificiteit van het onderwijs speelt hierbij een centrale rol. Dit institutionele kenmerk van het onderwijs verwijst naar de mate waarin opleidingen studenten voorbereiden op specifieke beroepen, dat wil zeggen hen beroepsspecifieke vaardigheden bijbrengen. Een belangrijk onderscheid dat gemaakt wordt in de literatuur is het onderscheid tussen beroeps- en algemeen vormend onderwijs. In Nederland wordt beroepsonderwijs doorgaans gezien als eindonderwijs; specifieke (of smalle) opleidingen waarin studenten worden voorbereid voor een specifiek beroep, bijvoorbeeld kapper. Algemene of brede opleidingen vinden we veelal in het voortgezet onderwijs (vmbo/havo/vwo) dat voorbereidt op eindonderwijs. Hier leren studenten geen specifieke vaardigheden. Een belangrijk argument in dit proefschrift is dat ook *binnen* het beroepsonderwijs opleidingen verschillen in hoe beroepsspecifiek ze zijn. Ik richt me in dit proefschrift daarbij in het bijzonder op het middelbaar beroepsonderijs (mbo). Met andere woorden, ook tussen mbo-opleidingen is sprake van variatie in beroepsspecificiteit en kun je stellen dat er zowel specifieke als brede opleidingen zijn. Maar wat is nou beter voor studenten qua kansen op de arbeidsmarkt: een specifieke of een brede opleiding? Over deze vraag is in zowel de politiek als de wetenschap de afgelopen jaren veel discussie.

In dit proefschrift onderzoek ik daarom de relatie tussen de beroepsspecificiteit van het onderwijs en de arbeidsmarktintegratie van jongvolwassenen (18- tot 27-jarigen). Ik bestudeer arbeidsmarktintegratie aan de hand van de volgende uitkomstmaten: directe arbeidsmarktintrede (na afstuderen), betaald werk, een aansluitende baan (zowel qua opleidingsniveau als richting), baanzekerheid (wel/geen vast contract) en inkomen (bruto uurloon). Ik onderzoek welke mechanismen op het niveau van individuen, opleidingen en onderwijssystemen (oftewel landen) bijdragen aan de arbeidsmarktintegratie van jongvolwassenen. Ook bekijk ik of de relatie tussen de specificiteit van het onderwijs en de arbeidsmarktintegratie verschilt tussen macro-economische omstandigheden (regio's en landen).

Een belangrijke vraag is *waarom* beroepsspecifiek onderwijs naar verwachting leidt tot een betere integratie van jongvolwassenen op de arbeidsmarkt. Drie mechanismen worden veelvuldig in de literatuur aangehaald. Ten eerste wordt vanuit de theorie van het menselijk kapitaal beargumenteerd dat meer beroepsspecifiek onderwijs leidt tot meer beroepsspecifieke vaardigheden en dus productievere werknemers. Dit is gunstig voor werknemers, die om die reden een voorkeur hebben voor studenten

met een beroepsspecifieke onderwijsachtergrond. Ten tweede zijn studenten van beroepsspecifieke opleidingen of studenten in landen met een beroepsgericht onderwijssysteem in staat om duidelijkere signalen en meer informatie te geven aan potentiële werkgevers over hun kwalificaties, vaardigheden en hun mate van (directe) productiviteit. Ten derde kan beroepsspecifiek onderwijs leiden tot een betere arbeidsmarktintegratie vanwege betere netwerkmogelijkheden. Beroepsspecifiek onderwijs wordt gekenmerkt door veel nadruk op de beroepspraktijk en korte lijntjes tussen de opleiding en bedrijven. Door praktijklessen of stages komen studenten in direct contact met (stage)bedrijven, praktijkopleiders en werkgevers. Dit sociale netwerk kan studenten helpen om tijdens of na het afronden van de opleiding aan een baan te komen. De waarom-vraag in dit proefschrift is op verschillende niveaus onderzocht, omdat de invloed van de beroepsspecificiteit van het onderwijs op arbeidsmarktkansen verloopt via processen op het niveau van individuen, op het niveau van opleidingen en op het niveau van onderwijssystemen. In mijn promotieonderzoek breng ik de invloed van individuele, opleidings- en institutionele kenmerken in kaart om zo de verschillen in de arbeidsmarktkansen van jongvolwassenen te verklaren.

Op het niveau van het onderwijssysteem wordt de mate van beroepsspecificiteit doorgaans gemeten aan de hand van de omvang van het beroepsonderwijs in het hoger secundair onderwijs, oftewel, het aandeel studenten dat beroepsonderwijs volgt. In Nederland is dat het aandeel mbo-studenten in het totaal aantal deelnemers aan mbo en tweede fase (bovenbouw) havo en vwo. Hierbij zijn er grote verschillen tussen landen: Nederland kent een groot beroepsonderwijssysteem (het mbo), terwijl bijvoorbeeld de Verenigde Staten of het Verenigd Koninkrijk zich typeren als algemene onderwijssystemen. Op het niveau van opleidingen verwijst de specificiteit naar de mate waarin opleidingen beroepsspecifieke vaardigheden bijbrengen, oftewel studenten voorbereiden op een beperkt aantal beroepen. Als studenten van opleiding A terechtkomen in vijf verschillende beroepen en studenten van opleiding B in vijftien verschillende beroepen, dan is opleiding A specifieker dan opleiding B. De beroepsspecificiteit op het individuele niveau betreft de mate waarin studenten meer specifieke dan wel meer generieke vaardigheden verwerven. Voor het beantwoorden van mijn onderzoeksvraag is het dus belangrijk om de processen op deze drie niveaus in acht te nemen.

Ondanks dat het bekend is dat de effecten van de beroepsspecificiteit van het onderwijs verlopen via mechanismen op deze drie niveaus, concentreert het huidige onderzoek zich meestal op één, soms twee van deze niveaus. Hierdoor zijn theoretische inzichten en empirische bewijzen gefragmenteerd. De focus op een niveau leidt tot een onvolledig beeld of in het ergste geval tot een onjuist beeld, aangezien verschillende processen en onderliggende mechanismen zich op verschillende niveaus manifesteren. Bovendien kan de uitwerking of invloed van deze mechanismen verschillen tussen die drie niveaus. Een belangrijke stap in het vergroten van de huidige inzichten is daarom expliciet aandacht te besteden aan de drie niveaus waarop de specificiteit van het onderwijs werkzaam is. Dit

doe ik in mijn proefschrift. Door de specificiteit op elk niveau opeenvolgend te onderzoeken en rekening te houden met de mechanismen op ieder niveau, probeer ik een genuanceerder beeld te schetsen hoe de beroepsspecificiteit van het onderwijs op de verschillende niveaus verband houdt met de integratie van jongvolwassenen op de arbeidsmarkt.

Verder is bekend dat ongunstige macro-economische omstandigheden een nadelige invloed hebben op de kansen van jongvolwassenen op de arbeidsmarkt. Maar opvallend weinig is bekend over de mate waarin de impact van de beroepsspecificiteit varieert tussen macro-economische condities. Zijn specifieke opleidingen een zegen of een vloek voor schoolverlaters in landen of regio's met hogere werkloosheidscijfers? Op deze vraag probeer ik ook een antwoord te geven in mijn proefschrift.

In **hoofdstuk 2** van mijn proefschrift begin ik met een literatuuroverzicht van de theoretische en empirische inzichten op dit onderzoeksterrein. Daarnaast geef ik een overzicht van gangbare indicatoren die de specificiteit van het onderwijs op elk niveau meten. In de empirische studies in hoofdstukken 3, 4 en 5 pas ik een aantal van deze indicatoren toe. Op basis van de bestaande literatuur kan worden geconcludeerd dat de overgang van school naar werk soepeler verloopt in landen met een uitgebreid stelsel van beroepsonderwijs, zoals het mbo in Nederland. Beroepsspecificiteit wordt daarin echter ten onrechte als een homogene entiteit voorgesteld: ook binnen het beroepsonderwijs kan (het effect van) de beroepsspecificiteit sterk variëren. Om dit verder te verkennen, richt ik me in hoofdstukken 3 en 4 op het mbo. Allereerst onderzoek ik de specificiteit van het onderwijs op het niveau van individuen (hoofdstuk 3), vervolgens op het niveau van individuen en opleidingen (hoofdstuk 4), en tot slot ook op het niveau van onderwijssystemen (hoofdstuk 5). Hieronder volgt een beschrijving van de empirische studies.

In **hoofdstuk 3** staat de rol van de specificiteit van het onderwijs op het individuele niveau centraal. Het doel van deze studie is meer inzicht te krijgen op de vraag of specifieke vaardigheden positiever samenhangen met de arbeidsmarkpositie van mbo-schoolverlaters dan generieke vaardigheden. Tegelijkertijd houd ik rekening met de invloed van verschillende (onderwijs)signalen, zoals stage-ervaring of het volgen van een beroepsbegeleidende leerweg (bbl) in plaats van een beroepsopleidende leerweg (bol). Deze studie beoogt daarmee meer inzicht te geven in de bijdrage van individuele vaardigheden en signalen aan de arbeidsmarktkansen van mbo'ers. De resultaten laten zien dat vaardigheden (op basis van zelfinschatting van studenten) en de meeste onderwijssignalen onafhankelijk van elkaar bijdragen aan het bevorderen van de kansen van mbo-schoolverlaters op de arbeidsmarkt. Ik vind, in lijn met de theorie van het menselijk kapitaal, dat specifieke vaardigheden positiever samenhangen met de arbeidsmarktuitkomsten van mbo'ers dan generieke vaardigheden. Verder vergroten een eerdere stage-ervaring bij het bedrijf en een bbl-traject de arbeidsmarktkansen van mbo'ers. Dit schrijf ik toe aan duidelijkere signalen van werkervaring en productiviteit en aan netwerkmechanismen.

In **hoofdstuk 4** onderzoek ik de invloed van de beroepsspecificiteit tussen opleidingen *binnen* het mbo. Tegelijkertijd houd ik rekening met de individuele kenmerken en (generieke en specifieke) vaardigheden die ik in hoofdstuk 3 heb onderzocht. Deze studie laat allereerst zien dat er inderdaad sprake is van variatie in de beroepsspecificiteit tussen opleidingen binnen het mbo. Ik concludeer dat de bestaande literatuur het beroepsonderwijs ten onrechte als homogene entiteit beschouwt. Daarnaast laten de resultaten zien dat een hoge mate van beroepsspecificiteit van opleidingen de arbeidsmarktintrede van schoolverlaters bespoedigt. Verder toets ik in hoeverre de overgang van een mbo-opleiding naar de arbeidsmarkt wordt beïnvloed door regionale jeugdwerkloosheid. Tegen de verwachting in vind ik dat de invloed van de beroepsspecificiteit van opleidingen niet varieert met regionale jeugdwerkloosheidcijfers.

In **hoofdstuk 5** richt ik mij op de specificiteit van het onderwijs op het niveau van opleidingen en onderwijssystemen. Een grote beperking van bestaande landenvergelijkende studies is dat de specificiteit van het onderwijs daarin alleen op het geaggregeerde (land)niveau is onderzocht, terwijl de werkzame mechanismen zich volgens de theorie afspelen op het niveau van opleidingen. In deze studie bestudeer ik daarom de invloed van de specificiteit van opleidingen én onderwijssystemen op het hebben van een betaalde baan en op het bruto uurloon. Uit deze studie komt naar voren dat met name de specificiteit van opleidingen belangrijk is in het verklaren van de kans op betaald werk. De specificiteit van het onderwijssysteem heeft geen (noemenswaardige) invloed. Bovendien is de positieve invloed van de specificiteit van opleidingen sterker in landen waar de werkloosheid hoger is. Verder blijkt het uurloon van individuen niet afhankelijk te zijn van de specificiteit van opleidingen. De conclusie is dat eerdere landenvergelijkende studies de invloed van de specificiteit van het onderwijssysteem op deze twee uitkomsten hebben overschat door onvoldoende rekening te houden met de variatie in de specificiteit van opleidingen.

Alle bevindingen van dit proefschrift laten zien dat jongvolwassenen van specifiekere opleidingen een soepelere arbeidsmarktintegratie kennen dan jongvolwassenen van bredere opleidingen, ook *binnen* het mbo. Een voor de hand liggende nuancering die desalniettemin vaak over het hoofd gezien wordt, is dat de beroepsspecificiteit van het onderwijs niet voor alle arbeidsmarktuitkomsten even bevorderend werkt. Specifieke opleidingen zijn met name bevorderend voor een snelle arbeidsmarktintrede en voor het vinden van een betaalde baan. Verder blijkt een reeds bestaande relatie met bedrijven (door middel van een stageplek) en het volgen van een bbl-traject (of vergelijkbare werktrajecten in andere onderwijssystemen) van groot belang voor de intrede van mbo-schoolverlaters op de arbeidsmarkt. Dit wijst erop dat duidelijke signalen (van onder andere productiviteit en werkervaring) en netwerkmechanismen van groot belang zijn voor de arbeidsmarktintegratie van jongvolwassenen. Deze processen komen in het onderwijs (nog beter) tot stand wanneer werkgevers of bedrijven betrokken zijn bij het onderwijsprogramma of door stageplekken aanbieden. Ook komen deze processen beter tot stand als opleidingen sterk gekoppeld zijn aan een beperkt aantal beroepen.

Welke inzichten geeft dit proefschrift door het in kaart brengen van de invloed van individuele, opleidings- en institutionele kenmerken? Ten eerste, dat bestaande landenvergelijkende studies de invloed van de specificiteit van onderwijssystemen mogelijk overschat hebben door onvoldoende rekening te houden met de variatie in de specificiteit tussen opleidingen *binnen* een land. Zelfs binnen het mbo in Nederland vind ik variatie in de specificiteit van opleidingen. Een dichotome verdeling tussen beroeps- en algemeen vormend onderwijs (bijvoorbeeld tussen mbo en havo/vwo) volstaat op geen enkel niveau meer. Tot slot kan de specificiteit van onderwijs een andere uitwerking hebben op de verschillende niveaus. Ook om deze reden is het van belang om in onderzoek rekening te houden met de verschillende niveaus.

Dankwoord

De laatste woorden die ik voor mijn proefschrift op papier zet, wil ik graag besteden aan het uitspreken van mijn dank aan iedereen die direct of indirect een bijdrage heeft geleverd aan de totstandkoming van dit proefschrift.

Allereerst wil ik graag mijn promotoren bedanken. Jullie hebben een belangrijke rol gespeeld tijdens de eerste stappen van mijn carrière, en ik heb dan ook veel van jullie geleerd. Maarten, ondanks dat ik niet de specifieke opleiding had gevolgd die doorgaans gelinkt is aan een PhD-positie, gaf je mij de kans om dit promotieonderzoek uit te voeren. Bedankt voor je vertrouwen in mij. Met een nuchtere kijk op zaken, een ontspannen houding en pragmatische aanpak gaf je mij de ruimte om mijn eigen weg te vinden en stuurde je bij waar dat nodig was. Dank daarvoor. Ook wil ik je bedanken voor je bemoedigende woorden en geduld in de laatste stressvolle maanden ten tijden van corona. Maurice, ik heb enorm veel bewondering voor hoe goed jij in de eerste, ruwe versies van mijn teksten en (vele) modellen, de kernboodschap weet aan te wijzen en te verwoorden. Dank voor je begeleiding, je constructieve insteek en je enthousiasme. Lieselotte, na een paar maanden kwam jij ons team versterken. En wat heb jij veel kleur gegeven aan onze bijeenkomsten en mijn tijd als promovenda. Jouw bevlogenheid voor het project en enthousiasme over mijn papers gaven mij veel energie! Dank voor je vertrouwen in mijn mogelijkheden, voor de aanmoedigingen en voor je onvoorwaardelijke steun. Ik ben blij dat ik je eerste aio mocht zijn en wat hebben toekomstige aio's het getroffen met een begeleider zoals jij!

Ook de leden van de manuscriptcommissie – Gerbert Kraaykamp, Thijs Bol en Rolf van der Velden – wil ik graag bedanken voor de tijd en energie die zij hebben gestoken in het lezen en beoordelen van mijn proefschrift.

During my PhD, I was fortunate to spend three months as a visiting scholar at the WZB Social Science Center in Berlin. I would like to thank Heike Solga and Jan Heisig for all the meetings and many interesting discussions. Your level of critical thinking and broad theoretical knowledge about skills, returns to education and labor market inequalities were truly inspiring. I would also like to thank the other members of the research unit for their warm welcome. A special thank you to Matthias, Christian K., Babeta, Carla, Mona, Paula, Ingrid, and Christian B. for making me feel at home.

Mijn dank gaat uit naar al mijn collega's van de vakgroep sociologie in Nijmegen. Ik kijk met ontzettend veel plezier terug op mijn aio-tijd en dat heeft voor een groot gedeelte te maken met de leuke collega's en de collegiale werksfeer op de vakgroep. De lat is

hoog gelegd! Graag bedank ik Christine, Marjolijn en Anemoon voor alle secretariële ondersteuning (en de nodige afleiding).

In het bijzonder wil ik mijn mede-aio's bedanken, Carlijn, Carly, Inge, János, Jeanette, Joran, Klara, Marlou, Nella, Niels B., Paula, Renae, Roos, Saskia, Take, Tery, Tijmen en Thijmen. Ik had me geen fijnere groep kunnen wensen. Dank voor alle gezellige (en veel te lange) gesprekken, discussies en weekendanekdotes bij de koffieautomaat. Dank dat ik altijd bij jullie terecht kon voor advies en de nodige ontspanning. Roza, ontzettend bedankt voor de fijne en leerzame samenwerking voor Leefstijlen.

Mijn collega's bij ResearchNed wil ik bedanken voor het warme ontvangst. Ik kijk uit naar het moment om straks weer naar kantoor te kunnen. De verhalen over friet op vrijdag, samen puzzels maken en in het park lunchen klinken als muziek in mijn oren.

Naast mijn collega's wil ik mijn lieve vrienden bedanken voor alle steun de afgelopen jaren. JC, jullie zijn simpelweg geweldig. Alana, Eline, Imke, Jill, Jiri, Martijn, Michiel, Ruben, Sidney, Sofie, Stephanie, Thuong, Veerle, Claire, Jelmer, Matthijs en Pieter: DANK voor de vele mooie avonturen. Voor alle feestjes, festivals, gangweekenden, vakanties, Yolosinterklaas, China-Delight-avonden, gangfeestjes en spelletjesavonden. Iem, Fur, Claire en Stef: dank voor de avonden gevuld met eten, kettingen draaien, goede (en onzinnige) gesprekken en slechte televisie kijken. Jill, dank voor de vele uitstapjes (Villa, Smaakmarkt, Mensen Zeggen Dingen); dat er nog veel mogen volgen. Sidney, dank voor je mooie vriendschap de afgelopen twaalf jaar. Jelmer en Lennart, dank voor jullie warmte en gezelligheid op de Hugo. Lucie, jouw activisme, kennis van popcultuur en liefde voor koken, mode, muziek en studio Ghibli zijn een paar redenen waarom ik je een geweldig mens vind. Stefan en Roland, avonden met jullie zijn altijd gevuld met schaterlachen en bijzondere gesprekken.

Ook wil ik mijn (schoon)familie bedanken. René en Alexandra, dank dat jullie altijd voor ons klaarstaan. Dank voor de uitstapjes, etentjes, wandelingen en de ontelbaar veel kleine dingen (frikandelbroodjes!). Dank voor de onvergetelijke reis naar Madagaskar met z'n allen. Diederik, Marit en Julius: dank voor de bezoekjes, voor jullie luisterend oor, voor de donuts, voor Kate Mos. Wat is het fijn om jullie zo dichtbij te hebben. Mijn immer trotse vader wil ik bedanken voor zijn vertrouwen in dat ik alles kan bereiken. Ik had niets liever gewild dan dat mama het schrijven van mijn proefschrift mee had kunnen maken, maar ik weet zeker dat ze net zo trots was geweest. Jullie hebben veel moeten achterlaten; dank voor alles wat jullie voor ons hebben gedaan. Egi, dank dat ik altijd mijn ei bij jou kwijt kan en over alles met je kan praten. Azra, dank voor je warmte en je heerlijke kookkunsten.

Benjamin, de laatste weken heb je veel suggesties gedaan voor waar ik je zoal voor zou kunnen bedanken. Grapjas. Dank voor je humor, optimisme, geduld en voor je zorgzame karakter. De talrijke bij- en koosnamen ga ik natuurlijk niet uitschrijven; die mag je hier zelf aan toevoegen. Na vijf jaar gaat het nog steeds zo gemakkelijk en hebben we het nog steeds zo leuk met elkaar. Ik kijk uit naar al het moois wat nog komen gaat!

Ardita Muja
Nijmegen, mei 2021

About the author

Ardita Muja was born in Mitrovica, Kosovo, on November 21, 1990. She obtained a Bachelor's degree in Pedagogical Sciences in 2012, and a Master's degree in Pedagogical Sciences in 2013 and in Sociology in 2015 at the Radboud University in Nijmegen. In March 2016, she started as a PhD Candidate at the Department of Sociology at Radboud University and the Interuniversity Center for Social Science Theory and Methodology (ICS). She conducted the present dissertation, funded by Instituut Gak, under the supervision of Prof. dr. Maarten Wolbers, dr. Lieselotte Blommaert, and dr. Maurice Gesthuizen. From May to July 2019, she visited the research unit Skill Formation and Labor Markets at the WZB Social Science Center in Berlin, hosted by Prof. dr. Heike Solga and Prof. dr. Jan Heisig. As of September 2020, she works as a researcher at ResearchNed in Nijmegen. Her research interests include vocational education, school-to-work transitions, labor market inequalities, educational inequalities, as well as social stratification in general.

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The transition from school to work is pivotal in the lives of young people. It affects the first steps into the labor market, but is also closely related to other steps towards adulthood. Education plays a key role in preparing young people for and allocating them to the labor market. Central to this task is the vocational specificity of education. There appears to be a broad consensus that vocationally specific education smoothens the transition from school to the labor market. It is also well-established that the vocational specificity of education impacts young people's integration into the labor market through processes at the level of individuals, educational programs, and educational systems. While this is known, research typically focuses on one, or a subset of these levels, and as a result, theoretical insights and empirical evidence are rather fragmented. Moreover, it may lead to an incomplete or at worst an erroneous view, as different processes and underlying mechanisms can manifest themselves at different levels, and the effects may also differ across the three levels. This dissertation provides an overview of and more nuanced insights in how the vocational specificity of education on the three different levels are related to young people's transition into the labor market.

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