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Graduate employability in Europe: the role of human capital, institutional reputation and network ties in European graduate labour markets

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ABSTRACT

The link between higher education and employment is central to the understanding of social stratification and social mobility. We use three theories to analyse the importance of education and credentials in recruitment decisions in European graduate labour markets: human capital (HC), network capital (NC) and reputational capital (RC) theory. Latent class modelling was applied to data from over 5,000 European private-sector companies to allow segmentation. The results identify four groups of companies using different HC, NC and RC mixes in the recruitment process. A 'complementary effect' was found between these forms of capital at the time of recruitment. Company classes, however, vary in their emphasis on different types of capital according to their characteristics. The article further contributes to the literature by exploring how national political economies relate to segmentation patterns, and questioning some of the central tenets of the Varieties of Capitalism literature.

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Graduate labour markets; employer demands; credentials; human capital; reputational capital; network capital; survey; Europe

1. Introduction

Employers' hiring preferences are critical to the distribution of social opportunities and social stratification. Yet, employer recruitment strategies remain a 'black box' with little systematic research on employers' hiring behaviour, especially in cross national settings (Mayrhofer et al. 2011; Di Stasio and Van De Werfhorst 2016, 78). A number of recent contributions have progressed our understanding of the role of different forms of capital in recruitment . The first strand of this research relies on human capital (HC) or cognate theories to explain the importance of formal qualifications and, to a lesser extent, skills in recruitment (see Di Stasio 2014; Gaddis 2015; Humburg and van der Velden 2015; Di Stasio and Van De Werfhorst 2016; Protch and Solga 2015; Petzold 2020). The second investigates the role of elite credentials, or reputational capital (RC), for elite graduate recruitment (Brown, Lauder, and Ashton 2011; Rivera 2016). The third, explores the role of networks in recruitment (network capital, or NC) (see Fernandez & Galperin 2014, Burks et al. 2015). These three strands seldom reference each other and no research has, to our knowledge, systematically explored the relative importance of these different forms of capital in recruitment. In this article we aim to fill this gap. We explore four questions. We examine, first, the extent to which different forms of capital (HC, RC, NC) are used in graduate recruitment in Europe and, second, how they relate to each other. Finally, given that 'institutions, particularly transnational companies (TNCs) and nation states are

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central to an adequate explanatory account of the demand and reward for skills' (Lauder, Brown, and Cheung 2018, 499), we research how firms' organisational characteristics (third) and national political economy (fourth) relate to the use of different forms of capital in recruitment.

The paper makes four main contributions. First, although there are various theories on how different forms of capital matter in the labour market, little has been said about the extent to which these apply in real labour markets, a central issue in this article. Second, this is the first attempt to investigate the relationship between HC, RC and NC and different organisational and national contexts during recruitment. The third and fourth contributions are methodological. While most previous sociological studies in this area have been based on small samples sizes from one or two countries, the article utilises company-level data from a large sample of 31 European countries. This not only helps the generalisability of our results, but also enables us to explore the role of companies' organisational and national institutional characteristics. Finally, the study is innovative in our application of multi-group and multi-level latent class models to examine the relationship between various forms of capital in recruitment.

In terms of results the article shows, first, that while all the forms of capital analysed are relevant in graduate recruitment, their roles vary quite markedly: some assume significance more frequently than others, and not always in the ways expected in the literature. Second, it shows that different forms of capital complement each other in graduate recruitment, so that concentration on a single factor is likely to reduce individual employability – the exception being, to some extent, technical skills. Third, the organisational context is important: firms vary substantially in their 'capital-mix' requirements, which signals that labour markets are highly segmented according to firms' characteristics. Fourth, our results question central tenets of the Varieties of Capitalism (VoC) literature regarding skills, as employers in Coordinated Market Economies (CMEs) exhibit greater demand for both technical and generic skills than in Liberal Market Economies (LMEs). On the whole, the analysis lends greater support to Streeck's (2011) claim that CME produce and demand higher skills than LME, than to the VoC literature that portrays LMEs as generic, high and portable skill regimes.

2. Graduate recruitment: forms of capital and the importance of the organisational and national context

We live in an age of widespread access to higher education with around 20 million students in tertiary education in the EU-28 alone (Eurostat 2019). Stratification researchers argue that as quantitative differences in education decline, the middle classes seek to effectively maintain their advantage through access to qualitatively 'better' educational experiences (Lucas 2001). Such 'horizontal differentiation' (Gerber and Cheung 2008) can include the acquisition of particular skill sets, obtaining elite credentials or credentials which employers trust, because of their links with the granting institution. These strategies are rooted in the human, reputational and network capital literatures. There is some debate as to whether these should be considered forms of capital, as they cannot be owned by others and cannot be traded permanently in a market – see Piketty's (2014:46) justification for the exclusion of human capital from his definition of 'capital'. Yet, the reference to 'capital' here denotes that each of these three factors (human, reputational and network) provides resources that can be exchanged in the labour market to obtain material rewards. Below we present the main characteristics of HC, RC and NC theories of relevance to our study (see Brown, Lauder, and Cheung 2020; Brown, Lauder, and Ashton 2011; Strathdee 2008, for more extensive reviews). The review concludes that these different forms of capital are related but distinct. Very few studies, however, have investigated their relationship in graduate recruitment, because the literature on graduate employability is dominated by credential-centred approaches (Tomlinson 2017). Boxman, De Graaf, and Flap (1991) is an exception, but their study was based on professionals, rather than the transition from education to work, and focused on a single country and two forms of capital, which were also measured differently to our study.

This gap in the literature leads us to the formulation of new questions in relation to these theories. We present four research questions and associated hypotheses on the prevalence of and relationship between different forms of capital in graduate recruitment, and how those may be affected by the organisational and national context.

2.1 Forms of capital in graduate recruitment

2.1.1 Human capital

HC theory offers a general explanation of the relationship between education and the labour market (Becker 1964). Investment in education and training is evaluated, like any other investment, with reference to its rate of return. The theory proposes a sequence of causal relationships linking (1) investment in education and training, (2) skill development, (3) increased productivity, and (4) increased employability, higher earnings and economic growth (Souto-Otero 2007, 2010).

Becker (1964, 2002, 3) noted that human capital refers to 'knowledge, information, ideas, skills and health of individuals'. His analyses, however, focused more on formal educational investment than other forms of skills development. Consistently with this focus, human capital theory (HCT) has little traction in unpacking the meaning of 'skill'. The theory differentiates between generic and specific skills, but this distinction has nothing to do with the nature of skills: it is based on their 'portability' between workplaces. Generic skills are portable, whereas specific skills are not. It is, however, difficult to distinguish empirically between general and specific skills defined in this way (Raffiee and Coff 2016; Hansen 2011). Portability, moreover, is more related to the social setting in which skills operate, such as training and certification systems and level of standardisation between workplaces, than to their content (Streeck 2011).

Today, most HC studies continue to resort to years in formal education or highest level of education achieved to measure HC (Lauder, Brown, and Cheung 2018), and not to skills (Hanushek 2015; Barone and Werfhorst 2011). Moreover, when skills are considered in canonical HC work, the studies have centred on cognitive skills – which is consistent with its focus on formal education. As Heckman and Rubinstein note (2001:145) 'It is (. . .) surprising that academic discussions of skill and skill formation almost exclusively focus on measures of cognitive ability and ignore noncognitive skills. The early literature on human capital (e.g. Gary Becker 1964) contrasted cognitive-ability models of earnings with human capital models, ignoring non-cognitive traits entirely'. Following Heckman, we explore the role of qualifications but also different types of skills in recruitment: generic, technical and non-cognitive.

2.1.2 Reputational capital

Information about candidates' skills and competences is asymmetric in the recruitment process: job candidates know more about their human capital than employers do. In this context, as Spence (1973) noted, job candidates may decide to extend their years of schooling and obtain further qualifications to signal a range of unobservable characteristics to employers (ability, willingness to learn, etc.). In this article years of schooling are held constant (graduate recruitment) and employers may use other 'signals' to reduce their uncertainty around the hiring decisions.

RC theory stresses the importance of (scarce) reputational and cultural signals in recruitment. Attendance to an elite university is considered a positional good rather than a direct marker of human capital (Rivera 2016). Brown, Lauder, and Ashton (2011) suggest that graduate labour markets are increasingly tough due to the global expansion of higher education, which has outpaced the growth of quality graduate jobs, leading to 'job scarcity' (Brown, Lloyd, and Souto-Otero 2018). As such, a decreasing proportion of higher education graduates can succeed in attaining 'top' jobs associated with highly paid career paths. RC argues that the allocation of these jobs, in particular in multinational companies, is based on the identification of 'top talent', which can more easily and cheaply be recruited from 'world-class' universities (Brown, Lauder, and Ashton 2011). RC argues that the impact of attendance to world-class universities on labour market outcomes stems from their

selectivity and the unobserved characteristics of their students, which are positively correlated with productivity (motivation, diligence), rather than from the skills these acquire during their higher education. As Rivera expressed it (2016:71), when it comes down to education 'it was not the content that elite employers valued but rather its prestige', referring to 'super-elite' (not simply 'selective') institutions. Employers restrict competition for jobs to students from those institutions only.

RC, therefore, contests the presupposition of a significant portion of the HC literature 'that anything rewarded in a competitive labour market must be a skill' (Bowles, Gintis, and Osborne 2001, 1141). So, while HC suggests that recruitment of the most skilled and productive individuals is employers' main concern, RC offers different conclusions, underlining the social character of labour markets because 'companies artificially limit the pool of talent by targeting elite universities and ignoring graduates from less prestigious universities and colleges' (Brown, Lauder, and Ashton 2011, 93), which in turn makes skills acquisition class, gender and ethnically influenced. Although Gaddis (2015) remarks that the literature is inconclusive regarding the causal effect of selectivity on labour market outcomes, his own audit study is consistent with RC as he identifies a 'double bonus' for candidates from elite universities in recruitment into entry-level non-specialised graduate jobs in the USA: they are more likely to receive employer invitations to interviews and for jobs more often linked with higher listed salaries. By contrast, Jackson's (2009) study of recruitment into professional and managerial occupations using a sample of over 2500 large UK companies found no strong effect of institutional reputation on employer responses to applicants.

2.1.3 Network capital

While a substantial body of stratification research discusses the importance of individual social networks and social capital in the distribution of life chances, the role of institutional networks in graduate recruitment has been scarcely studied (Tholen et al. 2013). NC, like RC, emphasises the asymmetry of information between employers and candidates in recruitment processes (Miller and Rosenbaum 1997) but argues that social networks may provide employers with more reliable information about candidates than reputation (Ioannides and Loury 2004). Networks are seen to have an important role in recruitment because they provide information on difficult to observe characteristics, such as applicants' soft skills or motivation (Strathdee 2008, 151), reduce search costs and improve chances of a 'good fit' with the company (Fernandez, Castilla, and Moore 2000; Ioannides and Loury 2004; Mouw 2003). Wellman and Frank (2001, 6) define NC as 'the form of "social capital" that makes resources available through interpersonal ties'. NC can take the form of *institutional* networks (Inkpen and Tsang 2005), on which this article focuses. Di Stasio and Gërxhani (2015, 104) note the importance of focusing on institutional networks between educational institutions and employers, because they are increasingly important for the analysis of social (in)equality.

Strathdee (2008, 154) underlines the relevance of higher education-employer networks in the competition for jobs as: 'Linkages between the creators of innovative knowledge (e.g. universities) and firms' are essential 'to leverage advantage'. Following the logic of RC, employers could be expected to organise their networks by co-operating with elite universities only. However, according to NC 'although elite universities appear to be best placed to create innovative ideas (. . .) network formation is likely to be important at every level of tertiary education' (Strathdee 2008, 7). Ramos-Vielba and Fernandez-Esquinas (2012) note that university-industry relationships can take a variety of forms (consultancy, contract research, training, the creation of new physical facilities/ spin-off companies) and lower ranking universities may be particularly active in some of those activities. Trust in credentials arises not only from global prestige (RC), but also from repeated interaction. Such interactions also allow firms to assess the potential fit of candidates with their ethos and skills requirements. As such, contact with students and faculty is one of the main motivations for university-industry interaction (Lawton-Smith and Bagchi-Sen 2006). These arguments suggest that RC and NC are interrelated but distinct, and can be disentangled conceptually and empirically. In NC it is not 'knowing what' (HC) or 'coming from' (RC) but 'knowing who' that matters. The value of

NC originates from mutual knowledge and trust as well as from expected long-term mutual gains resulting from a stable relationship. As an increasing supply of graduates results in credentials providing less clear signals, networks may help employers to navigate through this complexity.

The above discussion leads to the formulation of the following two research questions and hypotheses for this study: *RQ1 – What forms of capital do European employers consider more often in graduate recruitment?*

HC theory hypothesises that it will be skills that matter most often in graduate recruitment (Hyp1a), while according to NC it will be connections between universities and employers (Hyp1b). RC underlines the importance of institutional prestige and proposes itself as relevant for an elite segment of the labour market. Reputational factors are therefore expected to be a priority for a small and elite share of employers (Hyp1c).

RQ2- How do human, reputational and network capital relate to each other in graduate recruitment in Europe?

Using different measurements of human and social capital to ours, Boxman, De Graaf, and Flap (1991) concluded that social capital adds to human capital in the generation of income, but also that their interaction does not multiply labour market returns. They argued that, in fact, human and social capital act as substitutes in the determination of income: when social capital is high, returns to human capital decrease, and income returns to human capital are highest on the lowest levels of social capital. By contrast, an integrative model of graduate employability would expect different forms of capital to be important for graduate employability, reflecting a complementarity effect (Hyp2). Consequently, employers would seek candidates that possess all different forms of capital. This, however, does not imply that different forms of capital will always be valued equally across organisational and national contexts, as discussed in more detail below.

2.2 The organisational context: firm characteristics

We exploited a rich set of organisational characteristics contained in our database to analyse the profile of companies that give greater importance to different types of capital asking:

RQ3- How do organisational characteristics affect variation in the importance attached to human, reputational and network capital in graduate recruitment in Europe?

Based on previous research (Brown, Lauder, and Ashton 2011; Dada and Fogg 2016; Hewit-Dundas 2013), we include organisations' and workforce profile (size, staff qualifications intensity, internationalisation of the workforce and field of recruitment), competitive strategy (degree of internationalisation of the business) and human resource development strategies (training intensity) in our analysis.

The RC literature has elaborated on the type of company that can be expected to give importance to RC in recruitment. Following this literature, we expect firms that emphasise the importance of RC to be different from those that emphasise HC or NC (Hyp3). We expect RC companies to be large multinational companies that recruit from a pool of international candidates, where graduates constitute a large group of employees, and to be highly oriented towards global markets (Brown, Lauder, and Ashton 2011; Rivera 2016). These companies also invest heavily in training to maintain their position, but stratify their graduate workforce highly in order to promote their best talents (Brown, Lauder, and Ashton 2011). Hence, we expect them to differentiate development strategies for (future) top management and other employees, leading to strong stratification in access to their training provision. Finally, we expect RC to be more important for companies that recruit mainly from 'soft' areas of study, where actual job performance can be more difficult to measure.

HC theory, by contrast, predicts a quasi-universal focus on knowledge and skills and does not provide strong predictions regarding the characteristics of companies that focus on HC. As noted by Hansen (2011, 47) HCT 'treats a year of education as a uniform good, with little acknowledgement of vast differences amongst national systems of education' and, one could say, this also extends to firm characteristics. In line with this argument, previous research has not found strong heterogeneity in

the characteristics of knowledge-intensive firms (Camacho and Rodriguez, 2005). HC emphasises the importance of education and skills to enhance the productivity of all workers. As such, companies relying on HC are expected to base their recruitment on skills, and compete globally for highly skilled workers, thus relying on international recruitment, although not as much as firms that rely on RC - those are expected to recruit from a network of global elite universities, the majority of which are based outside Europe.

Similarly, NC theory is not too specific regarding the type of companies that might be expected to 'network'. Dada and Fogg (2016) argue that SMEs tend to engage less with higher education institutions, but they nevertheless do to some extent: it is not only large companies that establish links with higher education. Hewitt-Dundas (2013) found that investment in training is positively correlated with companies' capacity to establish profitable and innovative network relationships with universities. The same held for the proportion of graduates employed in a company. High workforce globalisation is not expected to be a defining characteristic of this group as both local and global networks can be important to 'networking' companies (Strathdee 2008). As in the case of HC, we do not make any predictions regarding field of recruitment.

2.3 The institutional context: political economy and varieties of capitalism

The political economy literature suggests that national institutional arrangements influence persisting differences in firms' strategies. The 'varieties of capitalism' approach (Hall and Soskice 2001) argues that firms resolve their coordination problems in education and training, industrial relations or corporate governance differently in different political economy contexts. This literature identifies two main types of capitalist economies: 'liberal market economies' (LME), such as the UK, in which coordination problems are solved by means of hierarchies and market mechanisms and 'coordinated market economies' (CME), such Germany, in which coordination problems are resolved through collaboration and non-market mechanisms. These are two poles of a spectrum between which other market economies can be positioned.

In terms of education and training, CMEs are characterised by highly occupationally specific skills formation systems and LMEs by higher generic skills demand and production – as these skills facilitate job transitions in line with the fluid character of labour markets and high job turnover in LMEs. Streeck (2011) argues that the VoC literature uncritically accepts many of the premises of HCT in its analysis of skill. In line with HCT, VoC does not attempt to untangle the notion of 'skill', but a central element in this theory is the differentiation between generic and firm (or sometimes industry) specific skills. This distinction is simply captured by looking at the formal education system, and in particular the degree of use of vocational tracks in secondary education (high in CMEs) or general tracks and access to higher education (high in LMEs).

Generic skills in VoC, however, are not the same as generic (portable) skills in HCT, as they denote more attributes. Streeck (2011) argues that the distinction between generic and specific skills in VoC inadequately 'folds' three distinctive dimensions – level, breadth of content and portability of skills- into a single binary distinction. According to Streeck, VoC inadequately equates the general skills prevalent in LME with high, broad and portable academic skills, while it presents specific skills as narrow, non-portable and low (non-academic). Streeck (2011, 26) argues, by contrast, that CMEs rely on higher skills than LMEs and that employers trust qualifications more in CMEs. Fleckenstein, Saunders, and Seeleib-Kaiser (2011) also argue that Germany's CME relies on high skills to a greater extent than the UK LME: it has a larger share of workers in high-skilled occupations than the UK, as occupations with high specific skills are traditionally more prominent in Germany and high general skills demand has been increasing, reaching levels close to those of the UK. In fact, even Iversen and Stephens (2008:618) find in their empirical analysis of the stock of skills in different countries that LMEs 'do not do well on any aspect of the human capital formation except the literacy scores at the top' where they achieve some sort of parity with CMEs, and that: 'it is a bit of

a misnomer to call these 'specific skills countries' and liberal market economies 'general skills countries" (Iversen and Stephens 2008:632), although this does not prevent the authors from using these terms in the standard VoC way.

Leuze (2011, 248) indicates that country-specific differences in recruitment can stem from institutional complementarities between education and work. CMEs rely on 'production strategies that are based on cooperation and trust' (Leuze 2011, 248), and VoC indeed underlines the importance of NC between local business associations, educational institutions and firms in CMEs, as a way of trust development. Di Stasio and Van De Werfhorst (2016) and Hansen (2011) note that such close contacts lead to greater reliance and trust on certified credentials during recruitment in CMEs. By contrast, RC theory has been developed through the study of LMEs, where it can thus be expected to apply. There has been, on the other hand, little investigation on the extent to which RC applies to other types of political economy (see Busemeyer 2012). This leads us to a fourth research question:

RQ4- How does the importance of different forms of capital vary across European political economies?

From the previous discussion, CMEs are expected to have a higher proportion of companies where institutional NC is important (Hyp4a) and LMEs to have larger shares of companies that emphasise RC (Hyp4b). Mixed economies, such as those of Southern Europe, are expected to be in between. Education systems in Southern Europe tend to develop skills that are less specific than those developed in CMEs (Di Stasio 2014), but have less stratified higher education systems than LMEs. VoC expects higher education qualifications to be more important in LMEs, as they are 'the only kind of certificates that have real value" in their labour markets (Hansen 2011, 32), even if formal education credentials are less valid and trusted indicators of skills than in CMEs. This is because of the "absence of meaningful job certifications", and credentials with specific applicability in the labour market in LMEs (Hansen 2011, 31). However, the argument may be different in relation to skills -which are central to our measurement of employers' HC demands. Based on the literature presented earlier (Streeck 2011; Fleckenstein, Saunders, and Seeleib-Kaiser 2011), we expect HC factors (skills) to be more important in CMEs, in particular once we control for the level of education of candidates to focus only on graduates (Hyp4c).

The VoC literature underlines the importance of different mixes of skills in different political economies. Generic skills, understood in VoC as broad, portable and high (Streeck 2011), are expected to be more important than technical (specific) skills in LMEs, and the opposite in CMEs. We exploit the availability of detailed information on the demand for different types of skills in our database to incorporate this aspect in our analysis. We hypothesise, following VoC, that technical skills are more important for recruiters in CMEs (Hyp4d), and generic skills in LMEs (Hyp4e).

3. Data and methods

3.1 Data

The study uses data from the Flash Eurobarometer 304 on employers' perception of graduate employability, a unique data source to analyse the relative importance of HC, RC and NC for recruitment across European labour markets. Data were collected in 2010 through a single telephone survey of 7,036 chief human resource or chief executive officers from companies with at least 50 employees in the EU-27, Norway, Iceland, Croatia, and Turkey. Chief human resources staff and chief executive officers are in a good position to respond to questions on recruitment. They have a central role in the creation of policies and guidelines on and in setting strategic directions for recruitment in companies and an understanding of companies' recruitment requirements. Only data from private companies was analysed (N = 5,131), as these are the focus of the theories of labour market integration that we examine.

Table 1. Sample characteristics.

	Private companies
Company Size	
50–249	85%
250+	15%
Don't know/ no answer	0%
Graduate recruitment last 5 years	
Have recruited and plan to recruit more	67%
Have recruited but not planning to recruit more	26%
Did not recruit but planning to recruit	6%
Economic sector	
1 Manufacturing	33.5%
2 Mining and quarrying, electricity, water supply	4.7%
3 Construction	9.0%
4 Transportation and storage	4.3%
5 Information and communication	3.1%
6 Wholesale and retail trade; repair of motor vehicles and motorcycles	12.9%
7 Accommodation and food service activities	4.5%
8 Public administration and human health	2.9%
9 Financial and insurance activities	3.3%
10 Professional, scientific and technical activities	3.4%
11 Other services	18.5%

Source: Flash Barometer 304. Economic sector classification is reported as coded by the Eurobarometer survey.

Employer surveys can be a useful tool to contribute to our understanding of the labour market. Researchers can learn about candidate characteristics that employers consider relevant during the recruitment process, and not only in the CV review and shortlisting phase. All surveyed companies had recruited higher education graduates in the five years prior to the survey and/or were planning to recruit graduates in the following five years (see Table 1). The questions enquired about 'higher education graduates' generally, and the responses could be considered as referring to the most frequent graduate positions recruited by each company.

3.2 Operationalisation and measurement

Our analysis of the role of HC in the recruitment process differentiates between technical skills, generic skills, and non-cognitive skills. Respondents addressed 12 possible dimensions in responses to the question '*Rate the following skills and competencies in terms of how important they are when recruiting higher education graduates in your company*'. Non-cognitive skills included: communication skills, analytical and problem-solving skills, adaptability, decision-making, team-working skills, planning and organisational skills (see Brunello and Schlotter 2011; Morrison Gutman and Schoon 2013). Analytical and problem-solving skills were measured with a single item in this survey. While analytical skills are often considered cognitive skills, problem solving is normally considered a non-cognitive skill (Garcia 2014; Heckman and Kautz 2013; Brunello and Schlotter 2011, 26), although it has both cognitive and non-cognitive elements (Park and Lee 2004). Because some dimensions of analytical skills (being good with numbers or analysing text) are already captured by other items in the survey – see below-, we assumed that employers, in the answer to this item, focused on the non-cognitive elements of problem solving skills (such as perseverance, conscientiousness, etc.), and included this item under this category. Generic skills included: being good with numbers, reading/writing skills and foreign language skills. Technical skills included: computer skills and sector specific skills.

For each of these skills respondents chose between four categories: very important (4 points), rather important (3 points), rather unimportant (2 points) or not important at all (1 point). Consequently, after aggregation the scale for generic skills ranged between 3 and 12 points, for technical between 2 and 8 points and for non-cognitive skills between 6 and 24 points. Each scale was subsequently re-categorised into four categories reflecting the distribution of pooled data.

'Reputational capital' was measured using the question: *'How important is it for you to employ graduates from higher education institutions with high international rankings (with good reputations)'*. Employers were given the same four choices as for the question on the importance of skills. 'Network capital' was identified using the question: *'How frequently do you cooperate with higher education institutions in recruiting their graduates?'* Respondents were offered four choices: 'very frequently', 'rather frequently', 'sometimes' or 'never'.

The analysis of organisational characteristics made use of six covariates (size, staff qualifications intensity, internationalisation of the workforce, field of recruitment, degree of internationalisation of the business and training intensity) as outlined in section 2.2, capturing company and workforce profile, competitive strategies and human resource development strategies. The measurements for these covariates are outlined in Table 5. All analyses were performed using MPlus 8.1.

3.3 Analytical strategy

We use latent class modelling to provide a baseline classification of different types of employers according to their preferences for different types of capital during recruitment, and latent class with covariates to examine the role of organisational characteristics in the adoption of recruitment strategies. Finally, we use multi-level latent class modelling, which utilises the results of the baseline latent class model, to explore the relationship between national institutional contexts and recruitment strategies.

Latent-class modelling allows us to account for unobserved heterogeneity in the sample by introducing a categorical latent variable (Muthén 2004; Białowolski 2016; Białowolski and Chávez-Juárez 2021). In this study, latent class membership defines a mix of HC, RC and NC employed in a company's recruitment strategy. Consequently, it is no longer necessary to discuss each dimension of the recruitment strategy (HC, RC, and NC) and the attention can be shifted to combinations of those[1]. This technique enables us to (see also Vermunt and Magidson 2002):

(1) define the number of recruitment strategies (segments) in the market,

(2) present the distribution of answers to each item (question) based on the latent class, so to create profiles of companies reporting a given recruitment strategy,[2]

(3) provide formal (or semi-formal[3]) model comparisons with multi-group latent class (Kankaraš, Moors, and Vermunt 2011), which allows us to validate whether recruitment strategies are universal or country-specific.

In the multi-group approach, testing of the homogeneity of segments' patterns among groups is possible and it is introduced by a series of constraints. In this paper, different groups correspond to countries. Estimation of the latent class models is performed with a maximum likelihood estimator following the EM algorithm, in which the information on latent class membership is considered missing and thus is derived from the data (Muthén, Shedden, and Spisic 1999). To explain recruitment strategies the set of covariates discussed in section 2.2 was used. Following the multi-group approach, multi-level analysis was employed to obtain the number of country clusters that are associated with the same item response patterns, which implies similar mix of recruitment strategies. The comparison between models and the choice of the number of company segments, as well as country segments, was based on the Bayesian information criterion (BIC) (Schwarz 1978).

4. Results

4.1 What forms of capital matter most often in graduate recruitment in Europe? (RQ1)

Skills are the most important factor for recruitment according to respondents. The results show that the most prevalent type of capital for recruitment is HC (confirming Hyp1a), while the prevalence of RC is higher and the importance of NC lower than expected in Hyp1b and Hyp1c (Table 2).

Over half of respondents reported HC indicators in each of the three types of skills (general, technical, non-cognitive) to be (rather) important in their recruitment processes. Moreover, given that the scale for the HC skills types was constructed based on predefined thresholds, the cut off points for 'low' scores are relative to other companies, and could be considered, in absolute terms, moderately high. There is some debate on the sectors where different types of skills may be more demanded. Non-cognitive skills are expected to be more demanded in service-related sectors (Kureková et al. 2016), and we find partial confirmation of this. Separate analysis (cross-tabulations available upon request) show that the demand for technical skills is fairly widespread across sectors, but particularly high in the 'professional and scientific sector' and low in 'accommodation'. Generic skills are particularly valued in 'finance and insurance' and lowest in the 'ICT' sector. Non-cognitive skills are more demanded in service-related sectors ('public services', 'accommodation' and 'other services') and in 'construction'.

Thirteen per cent of the companies reported RC to be very important and almost 28% reported it as rather important. NC oriented strategies were reported much less frequently: more than four out of five companies in the pooled sample reported adoption of NC strategies only sometimes or never.

4.2 How do human, reputational and network capital relate to each other in graduate recruitment in Europe? (RQ2) and How does class membership relate to organisational context (RQ3)?

4.2.1 The relation between forms of capital for European employers

This section identifies four groups of employers according to the importance they attach to different types of capital in recruitment, making use of latent class analysis, and discusses the characteristics of firms in each group. In order to do this, we followed the procedure proposed by Kankaraš, Moors, and Vermunt (2011) for the choice of the number of latent classes; models with and without constraints on equality of parameters between countries were estimated. The model with unconstrained class probabilities and unconstrained conditional response probabilities was estimated first and the model with constrained conditional response probabilities but a possibility of varying class probabilities between countries followed. In the latter specification, the probabilities of class membership in different countries can be meaningfully compared because the definition of each latent class in terms of its indicators is preserved for all countries in the sample, i.e., in each country the same approaches to recruitment, as defined by the mix of HC, RC and NC, are established (yet,

Table 2. Proportion of responses with respect to indicators of HC, RC, NC .

Human capital				Reputational capital		Networking capital	
	Generic	Technical	Non-cognitive				
High score	39.0	41.7	23.0	Very important	13.0	Very frequently	6.3
Rather high score	25.5	32.8	27.4	Rather important	27.6	Rather frequently	11.8
Rather low score	19.5	18.3	25.2	Rather unimportant	37.0	Sometimes	37.5
Low score	16.0	7.2	24.5	Not important at all	22.4	Never	44.4

Source: Flash Eurobarometer 304.

Note: High score: 11–12 points for generic skills, 8 points for technical skills, and 24 points for non-cognitive skills; Rather high score: 10 points, 7 points, and 22–23 points for generic, technical and non-cognitive skills respectively; Rather low score: generic skills 9 points, technical 6–7 points, and non-cognitive 20–21 points. Low score implied 8 points or less in generic dimension, 5 points or less in technical dimension, and up to 19 points in non-cognitive dimension.

different proportion of employers might be using a given strategy). Finally, the model with not only constrained thresholds but also with constrained class probabilities was estimated. In such a specification, it is possible to compare the meaning of the classes and to state that the segmentation of the market does not differ between countries, i.e., in each country the same proportion of employers using a given recruitment strategy is observed. The values of BIC for the three specifications of the model are presented in Table 3.

The best fitting model is the 4-class, partially homogeneous specification – varying probabilities of class membership between countries but with the same definition of classes in different countries. In the following step, all the predictors presented in 2.2 were included to explain recruitment strategies. Wald test confirms significance of each of them. The model provides a good fit, as confirmed by the value of the entropy measure (0.812). Item response probabilities for each latent class in the final model are presented in Table 4.

The final model includes an implicit description of the latent classes of European firms' behaviour with respect to their recruitment strategies. There are four distinct groups of firms (classes 1–4). The largest group, comprising 30.7% all European companies is Class 4. These four groups and associated company characteristics are described below. Table 5 reports on the marginal effects of different company characteristics on latent class membership. For each row, the coefficient presents the percentage points increase/decrease in the probability of being in the particular group of recruiters with respect to the reference category. For example, being a large company increases the probability of being a rounded recruiter by 6.4 percentage points over a small company.

4.2.2 Reputational recruiters: the elite firm (global, selective and highly skilled)

The skills requirements of 'reputational recruiters' (class 1) and human capitalists (class 3) are the highest, substantially above those for rounded and recusant recruiters – in particular for non-cognitive skills. Their requirements for generic HC are the highest amongst all groups. They also give higher consideration to NC than other groups. However, what characterises this group the most is that it places very high emphasis on RC – attendance to high ranking institutions. Being large and internationalised, placing strong emphasis on the qualifications of their workforce and recruiting rather intensively from engineering and natural sciences, increase the probability of being a reputational recruiter. Their most defining characteristics compared to rounded recruiters, with whom reputational recruiters share some characteristics, are high workforce globalisation and lesser emphasis on training. Elite credentials may operate in these companies as a selective mechanism for the construction of their global 'talent pools', while their lesser emphasis on training may be related to the stratification of training provision in these firms. These findings support Hyp3 on the distinctiveness of RC companies by and large in the directions envisaged by RC theory.

4.2.3 Rounded recruiters: the international and developmental firm

Companies in class 2, 'rounded-recruiters', set moderately high requirements across the board. They require from their prospective employees high scores in terms of generic and technical HC, while they value soft skills to a somewhat lower extent. These companies emphasise NC and, to a lower extent, RC, although they do not lead in terms of requirements on any of these aspects. Being a large company, highly internationalised, qualifications and training intensive, with a relatively globalised

Table 3. BIC for heterogeneous, partially homogeneous and completely homogeneous models.

BIC	heterogeneous	partially homogeneous	completely homogeneous
1 class	99,997.30	99,470.03	99,470.03
2 classes	102,230.71	97,631.62	98,128.29
3 classes	–	97,389.49	97,995.67
4 classes	–	**97,346.31**	97,972.11
5 classes	–	97,379.28	

Table 4. Response probabilities in latent classes.

		c1	c2	c3	c4
		Reputational recruiters	Rounded recruiters	Human capitalists	Recusant recruiters
Percent of European companies in the group		**23.9%**	**29.8%**	**15.6%**	**30.7%**
Reputational capital	Very important	0.40	0.05	0	0.05
	Rather important	0.47	0.30	0.07	0.21
	Rather unimportant	0.12	0.52	0.45	0.37
	Completely not important	0	0.13	0.49	0.36
Networking capital	Very frequently	0.13	0.06	0.03	0.03
	Rather frequently	0.16	0.15	0.06	0.09
	Sometimes	0.34	0.48	0.24	0.37
	Never	0.37	0.31	0.67	0.52
Human capital – generic (summary score for 3 features; the more points the more important)	4 = 11–12 points	0.58	0.48	0.52	0.08
	3 = 10 points	0.26	0.32	0.24	0.19
	2 = 9 points	0.11	0.16	0.12	0.33
	1 = up to 8 points	0.04	0.04	0.11	0.39
Human capital – technical (summary score for 2 features; the more points the more important)	4 = 8 points	0.67	0.36	0.73	0.11
	3 = 7 points	0.24	0.47	0.21	0.31
	2 = 6 points	0.07	0.15	0.04	0.38
	1 = up to 5 points	0.01	0.02	0.01	0.19
Human capital – non-cognitive (summary score for 6 features; the more points the more important)	4 = 24 points	0.47	0.07	0.48	0.07
	3 = 22–23 points	0.30	0.34	0.30	0.17
	2 = 20–21 points	0.18	0.38	0.16	0.23
	1 = up to 19 points	0.06	0.20	0.06	0.53

Table 5. Marginal effects (in percentage points) for latent class membership in model with covariates.

		c1	c2	c3	c4
		Reputational recruiters	Rounded recruiters	Human capitalists	Recusant recruiters
Company Size (ref. up to 249 employees)	250 or more employees	6.4***	6.4**	−6.7***	−6.2**
Business Internationalisation (percentage of day-to-day operations involving dealing with people in- or from other countries) (ref. none)	less than 10%	−1.8	14.3***	−6.2***	−6.4**
	10–24%	4.7	29.3***	−8***	−26***
	25–50%	12***	20.7***	−8***	−24.7***
	more than 50%	10.7***	23.9***	−4.7**	−30***
Qualifications intensity (estimated share of employees with higher education level) (ref. up to 10%)	11–30%	5.1**	4.3*	−5.3***	−4.1*
	Over 30%	9.4***	15.2***	−18.8***	−5.8**
Training intensity (percentage of employees with higher education degrees participated in training to update their skills in the past 2 years) (ref. None)	Less than 10%	3.7	16.4***	−5.5**	−14.5***
	10–50%	2.6	28.3***	−9.8***	−21.1***
	More than 50%	1.4	22.6***	−2.8	−21.2***
Workforce globalisation (percentage of employees in the company with higher education degrees recruited from countries outside of Europe) (ref. None)	Less than 5%	3.5	9.5***	−14***	1
	5% or more	23.8***	4.5	−17***	−11.3**
Field of recruitment^ (educational fields from which higher education graduates are mostly recruited) (ref. Social sciences)	Engineering and natural sciences	3.5*	11.4***	−2.4*	−12.5***
	Humanities	2.5	−8.7**	0	6.3*
Industry (ref. Manufacturing)	Mining, electricity, water	12.5***	−19.4***	2.4	4.6
	Construction	11.6***	−11.6***	6.3***	−6.4*
	Transportation	0.8	3.2	−1.8	−2.2
	Information and communication	3.2	−2.2	−0.7	−0.4
	Wholesale and retail trade; repair of motor vehicles and motorcycles	2	−5.3	3.7*	−0.3
	Accommodation and food service	9.4**	1.1	−6.1	−4.4
	Public administration and human health	12**	−11.7*	0	−0.3
	Financial and insurance activities	−1.9	9	4.8	−11.8**
	Professional, scientific and technical activities	3.7	−13**	12***	−2.7
	Other services	4.3*	−5.5*	5***	−3.8

Note: * Represents variable significant at 0.01, ** significant at .05 level and *** significant at .01 level
^ Fields of recruitment were grouped from 12 initial categories into 3.

graduate workforce, and recruiting from engineering and natural sciences all increase the probability of being a rounded recruiter. The effects of business internationalisation and training intensity are particularly large.

4.2.4 Human capitalists: the national skills-oriented firm

The group 'human-capitalists' (class 3) places little emphasis on RC and NC and concentrates on HC requirements, in particular technical HC. They, thus, focus on skills. These companies have a very specific profile: being smaller companies and highly local in terms of both their workforce and the markets in which they compete, increases the probability of being a human capitalist company. In addition these companies tend to place less emphasis on elite qualifications and training than rounded or reputational recruiters, which signals that these companies emphasise the importance of immediately usable skills in new recruits ('plug and play' recruitment).

4.2.5 Recusant recruiters: national low skills firms

Class 4 can be labelled as 'recusant recruiters': these companies do not set high requirements, compared to others, in any of the forms of capital analysed. Recusant recruiters offer a particularly contrasting profile to rounded recruiters, as many of the defining characteristics of those strongly reduce the probability of being a recusant recruiter.

The four classes place a markedly different emphasis on various forms of capital. The class profiles, however, do not suggest a substitution effect between different forms of capital, whereby when one becomes more important another becomes less important. Rather, they suggest a complementarity or 'addition effect' (in line with Hyp2), whereby the differences between classes are based on increases in the importance of additional types of capital, not accompanied by a reduction in the importance of others: from low requirements across the board in the case of recusant recruiters, to higher requirements on other forms of capital for other types of recruiters.

The results presented control for sectoral differences. Some sector coefficients are significant. In particular, compared to firms in manufacturing (the reference category) firms working in professional/scientific/ technical services, and some parts of the construction sector, are more likely to be part of the 'human capitalist' class, which places a strong emphasis on technical human capital, but little on the reputation of university attended. Reputation is more important in the energy sector, parts of the construction sector, hospitality and public administration. Firms in financial services and in construction are particularly unlikely to be recusant recruiters in their graduate recruitment. Our findings, on the whole, provide consistent support to the idea that organisational context is relevant for recruitment strategies.

4.3 How does the importance of different forms of capital vary across European political economies? Forms of capital and Varieties of Capitalism (RQ4)

With multi-level latent-class-based segmentation, we distinguish the different composition of firms' strategies in different European countries. Figure 1 presents the results of the segments appearing at the second, country level.

The results do not conform to VoC expectations. CMEs like Germany, Austria, Sweden, Iceland or Finland have a somewhat stronger representation of rounded recruiters and human capitalists employers. This profile confirms a high emphasis on HC factors (confirming Hyp4c), in particular technical skills (confirming Hyp4d), and our measure of NC (confirming Hyp4a, which expected NC to be of greater importance in CMEs), in these economies. However, following VoC we also expected that LMEs would have large shares of employers that emphasise generic skills (Hyp4e – which is not confirmed) and reputational capital (Hyp4b, which is not confirmed). In fact, the demand for generic skills is much higher in CMEs than in LMEs, as explained below in this section.

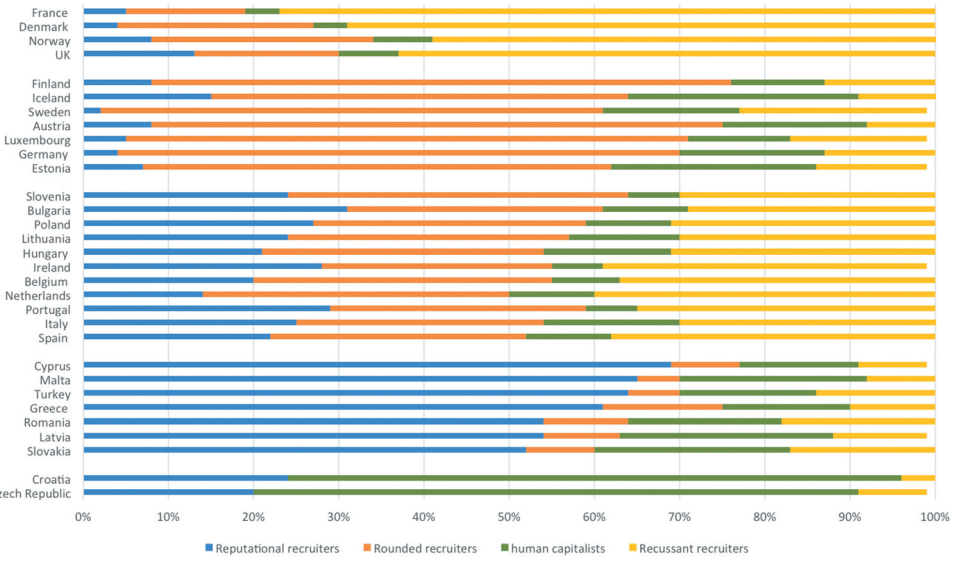

Figure 1. Composition of firms' strategies in European countries.

We used multilevel latent class modelling to classify countries in groups and as Figure 1 shows, the preferred solution – based on the BIC outcome-, favours the presence of five groups. The first group of countries (Norway, UK, Denmark and France) presents a large share of 'recusant recruiters', and although the presence of the UK could be expected in this group (Finegold and Soskice 1988), it includes countries across the political economy spectrum. Group 2 contains the bulk of CMEs (Germany, Austria, Finland, Iceland, Sweden, Luxembourg). This group exhibits a high frequency of rounded recruiters (who tend to place at least some emphasis on NC) and relatively high frequencies of human capitalists, as expected (in line with Hyp4a, Hyp4c and Hyp4d). The high importance of technical skills in central and Eastern European countries is confirmed in descriptive statistics – available upon request. Group 3 is more balanced than other groups in terms of employer profiles. This group incorporates mixed economies and various CMEs (Belgium, the Netherlands and Slovenia), and also one LME (Ireland) (against Hyp4b – which expected LMEs to emphasise RC – and Hyp4e – which expected LMEs to emphasise generic skills). South and Eastern European countries tend to be included in group 4, where reputational recruiters are prevalent (which is consistent with findings from the study abroad literature on higher returns to study at a top university for students from less economically developed countries – see Perkins and Neumayer 2011), and group 5, where human capitalists predominate clearly (Croatia and Czechia). The analysis thus, shows a much more mixed picture than suggested by the VoC approach.

The differences in skill-mixes required in the paradigmatic cases of Germany and the USA/ UK are a central element in the construction of the VoC theory, and we explored this aspect further through cross-tabulations – available upon request from the authors. Consistently with the above findings, we observe that technical skills are required much more often in Germany than in the UK, but the difference between the two countries is even larger in relation to generic skills: the share of employers reporting generic skills as important in their graduate recruitment was twice as high in Germany. This runs against VoC arguments and is more in line with Streeck's arguments (2011). Out of the three types of skills analysed, only non-cognitive skills are considered important more often in the UK than in Germany. The same patterns apply to a comparison with the Irish LME. The inclusion of a larger set of countries in the analysis presents further challenges to the VoC narrative, as other CMEs like France or Nordic countries exhibit different patterns to Germany, suggestive of a high degree of internal heterogeneity within the VoC types.

5 Discussion and conclusions

Employers' hiring preferences are central to the distribution of social opportunities. This study contributes to the analysis of the higher education–employment nexus by exploring, through the use of employer derived data, the degree to which different forms of capital – human, reputational, network- are associated with companies' recruitment strategies in European graduate labour markets, and the extent to which employers' preferences are related to the organisational context and the type of national political economy.

5.1 Forms of capital and recruitment

In relation to our question on the importance of different forms of capital for graduate recruitment in Europe, we found that the most frequent emphasis of recruiters is on skills (human capital). Yet, a substantial share of companies relies on reputational capital. Although perhaps the importance of RC is lower than some of the literature on international rankings would suggest, it is clear that it extends across a number of political economies and not only the LMEs where it was developed. Moreover, this form of capital was not only important for companies that recruit mainly from 'soft' areas of study – in fact we found the opposite. By contrast, companies relied on network capital less often than expected. Social networks of the type we analysed, thus, do not seem to provide a large share of employers with information about applicants. No group of companies was characterised by strong reliance on this type of capital. These findings point to the limitations of an exclusive focus on applicants' elite formal qualifications to understand recruitment decisions in graduate labour markets, but also warn against a 'closure' view of education (Bills 2003), where the importance of skills for recruitment is largely disregarded. Available theories narrate partial stories on what matters in recruitment, and we need integrative approaches that provide a better account of the factors that matter, where and when. This requires further theoretical innovation, and a departure from prevalent approaches in economics and sociology.

5.2 The relationship between forms of capital

This case is further reinforced by our exploration of how different forms of capital relate to each other in recruitment (RQ2). The analysis identified four classes of companies and while these differed in the relative importance of forms of capital, our results are consistent with the existence of an 'addition effect' between them – against findings in the US elite recruitment context, that noted an overriding power of elite credentials at the expense other factors, including skills (Rivera 2016). RC also valued skills highly – even if they use rankings to narrow the pool of applicants.

5.3 The firm context

Even though forms of capital are complementary, companies employ them in specific ways. We provided the first quantitative analysis, to our knowledge, on how the organisational context affects the importance of different forms of capital in recruitment strategies (RQ3). By shedding light on the conditions under which different types of capital are more likely to gain importance the study contributes to the understanding of the role of organisational factors in segmented graduate labour markets. We show that company characteristics are useful to discern employer preferences: these factors matter a great deal (consistently with Hyp3). We identified four classes of companies: recusant, human capitalist, rounded and reputational recruiters. Recusant recruiters, which set comparatively lower recruitment requirements, was the most frequent type closely followed by rounded recruiters, who expressed much more intensive requirements. This differentiation in requirements is consistent with accounts of the increasing stratification of graduate work. Larger

and internationalised companies (rounded and reputational recruiters) tend to set higher requirements across various forms of capital, although based on different 'mixes'. The results confirm that the RC literature provides a useful description of a specific, and in at least some ways elite, segment of the labour market. The HC literature, on the other hand, needs to better acknowledge that skills are not everything that counts in recrutiment, and that they will be differently rewarded depending on the company context.

5.4 Political economy

The political economy literature suggests that national institutional arrangements influence persistent differences in firms' strategies. This is reflected in our results, where we see substantial between-country variation on the relative importance of different types of capital in recruitment (RQ4). While the findings confirm that firms' approaches to graduate recruitment vary across European countries, they question VoC accounts.

We found that, in line with VoC arguments, CMEs rely more than LMEs on technically oriented human capital (Hyp4d), and on network capital (in line with Hyp4a). However, CMEs also attach greater importance than LMEs to generic HC (against Hyp4e), a point that contradicts a central tenet of VoC. Moreover, the bulk of UK companies are 'recusant' employers, which express comparatively low recruitment requirements – see also Di Stasio and Van De Werfhorst (2016) who report a lower emphasis on HC (measured through formal qualifications) for recruitment in England than in the Netherlands (a CME). The LMEs of UK and Ireland only exhibit higher requirements than Germany - and also the EU average – in relation to non-cognitive skills. These findings question the view of LMEs as 'high and generic' skills countries. Coupled with the existence of a much lower share of recusant employers and the presence of high proportions of rounded recruiters in Germany, our findings are more consistent with Streeck's 'conflict' and institutional account of variations in skills demand and supply between Germany and USA than with VoC 'economistic' (Streeck 2011) account. Streeck's account argues that CMEs produce a higher supply of and demand for skills than LME, where skills supply (and we see also demand) can be better described as comparatively 'low/ undifferentiated' rather than 'generic', in large segments of the labour market. While some of the patterns found in Germany are also seen in other CMEs (e.g. high representation of rounded recruiters that exhibit relatively high demands for generic and technical HC in Finland, Sweden or Iceland), there is a high degree of variation in capital requirements *within* VoC political economy groupings (see also Busemeyer 2009). This heterogeneity *within* groupings, in turn, points to the risks of disregarding national differences beyond political economy types and of the 'German synecdoque' in political economy analyses, where a part (Germany) is taken to neatly represent the whole.

5.5 Implications and limitations

Our results call for a re-think of the standard approaches used to analyse graduate recruitment towards more integrative approaches than is common and greater consideration of the segmented character of the labour market (Le Grand 2000). This reconceptualisation has practical implications for graduates' job-searching strategies -and for careers advisors-, as it asks them to consider the benefits of different capital-mixes for recruitment, and the ways in which the value of these vary across their preferred employment fields, types of companies and national contexts, given that organisational and institutional factors 'rug' the role that different forms of capital play in recruitment. The 'capital development' strategies of job seekers need to be attuned to the type of company and context that they target. In general, concentrating on a single form of capital will have detrimental effects on the employability of graduates. If concentration is the preferred strategy, the development of technical skills emerges as the best bet, as it provides recruitment

options in those companies that we have termed 'human capitalists', and attach little importance to other forms of capital -but this strategy is still risky as this is the least common type of firm in European labour markets.

Our data provided a unique source for an empirical comparative analysis on the role of different forms of capital in graduate recruitment, but also has limitations. It required us to rely on single questions to provide insights into the theories explored. Survey respondents were CEOs and HR officers, who set strategic directions for recruitment and can be expected to understand companies' recruitment requirements and policies – over which they have an oversight- well. However, data from operations staff involved in specific recruitment processes would have complemented our data well. A key question is the extent to which employers' survey responses and actual behaviour in recruitment correspond (hypothetical bias) – see Pager and Quillian (2005). According to Humburg and van der Venden (2015), the focus on skills requirements, rather than more controversial aspects of recruitment (such as discrimination), reduces the possibility of bias – see also Eriksson, Johansson and Langenskiöld (2012). Another concern relates to the extent to which employers can observe in recruitment processes the skills that they report as being relevant. In this respect, Piopiunik and collaborators (2018) and Protsch and Solga (2015) find that skills signals that resumes can contain are consequential for the decision to interview applicants. Employers also further their knowledge of applicants' skills through the use of interviews, observations and tests. Additionally, different types of capital may play a different role by type of vacancy (Bills 2003) – connections may be more important for public relations graduate jobs than for engineering jobs, which may demand more specialist skills (an aspect that future research could explore in greater depth). Although the data used was collected in 2010, the database is the most recent, and the only one to our knowledge, to collect information on employers' views on the role of the three forms of capital that we explored for graduate recruitment. Future research could collect similar data to assess how changes in access to higher education, technology and work organisation and human resources practices – for example through 'algorithmic recruitment'- may have transformed employers' recruitment strategies. Finally, future comparative work should help to further unpack the importance of institutional and organisational factors in graduate labour markets, and explore whether similar patterns to those found here for graduate recruitment extend to other segments of the labour market.

Notes

1. When years of schooling are held constant, as in the present article, screening and signalling theories (Stiglitz 1975; Spence 1973) are less useful to explain employers' preferences, as these theories focus on the benefits of acquiring higher levels of education.
2. In latent class models, it is assumed that the correlations between indicators (questions) are explained only by the latent class membership. It is assumed that within the latent class, the answers to different indicators are independent of one another and depend only on the class membership. In our case causal links run from class membership to the choice of recruitment strategy mix. See Vermunt (2008) for information on the distributional assumptions in latent class modeling.
3. In the group of semi-formal tests, model selection based on the information criteria can be used.

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No potential conflict of interest was reported by the author(s).

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References

Barone, C., and H.G. Van De Werfhorst. 2011. "Education, Cognitive Skills and Earnings in Comparative Perspective." *International Sociology* 26 (4): 483–502. doi:10.1177/0268580910393045.

Becker, G. 1964. *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*. Chicago: University of Chicago Press.

Becker, G. 2002. "The Age of Human Capital." Retrieved from https://www.hoover.org/sites/default/files/uploads/documents/0817928928_3.pdf [12 05 2021].

Białowolski, P. 2016. The Influence of Negative Response Style on Survey-based Household Inflation Expectations. *Quality & Quantity* 50: 509–528. doi:10.1007/s11135-015-0161-9

Białowolski, P. & F. Chávez-Juárez. 2021. Household Financial Portfolios in an Emerging Economy—The Case of Chile. *Emerging Markets Finance and Trade* 57(6): 1811–1827: doi:10.1080/1540496X.2019.1642193

Bills, D.B. 2003. "Credentials, Signals, and Screens: Explaining the Relationship between Schooling and Job Assignment." *Review of Educational Research* 73 (4): 441–449. doi:10.3102/00346543073004441.

Bowles, S., H. Gintis, and M. Osborne. 2001. "The Determinants of Earnings: A Behavioral Approach." *Journal of Economic Literature* 39 (4): 1137–1176. doi:10.1257/jel.39.4.1137.

Boxman, E.A., P.M. De Graaf, and H.D. Flap. 1991. "The Impact of Social and Human Capital on the Income Attainment of Dutch Managers." *Social Networks* 13 (1): 51–73. doi:10.1016/0378-8733(91)90013-J.

Brown, P., H. Lauder, and D. Ashton. 2011. *The Global Auction*. New York: Oxford University Press.

Brown, P., H. Lauder, and S.Y. Cheung. 2020. *The Death of Human Capital?: Its Failed Promise and How to Renew It in an Age of Disruption*. New York: Oxford University Press.

Brown, P., Lloyd, C. and Souto-Otero, M. 2018. *The Prospects for Skills and Employment in an Age of Digital Disruption: A Cautionary Note* (SKOPE Research Paper No. 127). Oxford University

Brown, P. and Souto-Otero, M. 2020. 'The end of the credential society? An analysis of the relationship between education and the labour market using big data'. *Journal of Education Policy* 35(1): 95–118.

Brunello, G., and M. Schlotter. 2011. *Non Cognitive Skills and Personality Traits: Labour Market Relevance and Their Development in Education & Training Systems*. IZA DP 5743. Bonn: IZA.

Burks, S.V., B. Cowgill, M. Hoffman, and M. Housman. 2015. "The Value of Hiring through Employee Referrals." *The Quarterly Journal of Economics* 130 (2): 805–839. doi:10.1093/qje/qjv010.

Busemeyer, M.R. 2009. "Asset Specificity, Institutional Complementarities and the Variety of Skill Regimes in Coordinated Market Economies." *Socio-Economic Review* 7 (3): 375–406. doi:10.1093/ser/mwp009.

Busemeyer, M.R. 2012. "On Phillip Brown, Hugh Lauder and David Ashtons' the Global Auction: The Broken Promises of Education, Jobs, and Incomes." *Socio-Economic Review* 10 (4): 79–93.

Camacho, J.A., and M. Rodríguez. 2005. "How Innovative are Services? An Empirical Analysis for Spain." *The Service Industries Journal* 25 (2): 253–271. doi:10.1080/0264206042000305448.

Dada, O., and H. Fogg. 2016. "Organizational Learning, Entrepreneurial Orientation, and the Role of University Engagement in SMEs." *International Small Business Journal* 34 (1): 86–104. doi:10.1177/0266242614542852.

Di Stasio, V. 2014. "Education as a Signal of Trainability: Results from a Vignette Study with Italian Employers." *European Sociological Review* 30 (6): 796–809. doi:10.1093/esr/jcu074.

Di Stasio, V., and H.G. Van De Werfhorst. 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. doi:10.1093/sf/sow027.

Di Stasio, V., and K. Gërxhani. 2015. "Employers' Social Contacts and Their Hiring Behavior in a Factorial Survey." *Social Science Research* 51: 93–107. doi:10.1016/j.ssresearch.2014.12.015.

Eriksson, S., Johansson, P. and Langenskiöld, S. 2012. 'What is the right profile for getting a job? A stated choice experiment of the recruitment process'. (IFAU Working Paper 2012:13). Uppsala.

Eurostat (2019) "Tertiary Education Statistics." https://ec.europa.eu/eurostat/statistics-explained/index.php/Tertiary_education_statistics#Participation [checked on 03 05 2019].
Fernandez, R.M., E.J. Castilla, and P. Moore. 2000. "Social Capital at Work: Networks and Employment at a Phone Center." *American Journal of Sociology* 105 (5): 1288–1356. doi:10.1086/210432.
Fernandez, R.M. and Galperin, R.V. 2014. 'The causal status of social capital in labor markets'. *Contemporary Perspectives on Organizational Social Networks Research in the Sociology of Organizations* 40: 445–462.
Finegold, D., and D. Soskice. 1988. "The Failure of Training in Britain: Analysis and Prescription." *Oxford Review of Economic Policy* 4 (3): 21–53. doi:10.1093/oxrep/4.3.21.
Fleckenstein, T., A.M. Saunders, and M. Seeleib-Kaiser. 2011. "The Dual Transformation of Social Protection and Human Capital: Comparing Britain and Germany." *Comparative Political Studies* 44 (12): 1622–1650. doi:10.1177/0010414011407473.
Gaddis, S.M. 2015. "Discrimination in the Credential Society: An Audit Study of Race and College Selectivity in the Labor Market." *Social Forces* 93 (4): 1451–1479. doi:10.1093/sf/sou111.
Garcia, E. 2014. "The Need to Address Non-cognitive Skills in the Education Policy Agenda." *Economic Policy Institute Briefing Paper* 386. Washington.
Gerber, T.P., and S.Y. Cheung. 2008. "Horizontal Stratification in Postsecondary Education: Forms, Explanations, and Implications." *Annual Review of Sociology* 34 (1): 299–318. doi:10.1146/annurev.soc.34.040507.134604.
Hall, P. A., and D. Soskice, eds. 2001. *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*. New York: Oxford University Press.
Hansen, H. 2011. "Rethinking Certification Theory and the Educational Development of the United States and Germany." *Research in Social Stratification and Mobility* 29 (1): 31–55. doi:10.1016/j.rssm.2011.01.003.
Hanusehk, E. A. 2015. "'Why Standard Measures of Human Capital are Misleading'." *KDI Journal of Economic Policy* 37 (2): 22–39. doi:10.23895/kdijep.2015.37.2.22.
Heckman, J. J., and T. Kautz (2013) "Fostering and Measuring Skills: Interventions that Improve Character and Cognition," *IZA Discussion Paper*, No. 7750, Institute for the Study of Labor (IZA), Bonn.
Heckman, J. J., and Y. Rubinstein. 2001. "The Importance of Non-cognitive Skills: Lessons from the GED Testing Program." *The American Economic Review* 91 (2): 145–149. doi:10.1257/aer.91.2.145.
Hewitt-Dundas, N. 2013. "The Role of Proximity in University-business Cooperation for Innovation." *The Journal of Technology Transfer* 38 (2): 93–115. doi:10.1007/s10961-011-9229-4.
Humburg, M., and R. van der Velden. 2015. "Skills and the Graduate Recruitment Process: Evidence from Two Discrete Choice Experiments." *Economics of Education Review* 49,: 24–41. doi:10.1016/j.econedurev.2015.07.001.
Inkpen, A.C., and E.W. Tsang. 2005. "Social Capital, Networks, and Knowledge Transfer." *Academy of Management Review* 30 (1): 146–165. doi:10.5465/amr.2005.15281445.
Ioannides, Y.M., and L.D. Loury. 2004. "'Job Information Networks, Neighborhood Effects, and Inequality." *Journal of Economic Literature'* 42 (4): 1056–1093. doi:10.1257/0022051043004595.
Iversen, T. and Stephens, J.D. 2008. 'Partisan politics, the welfare state, and three worlds of human capital formation'. *Comparative Political Studies* 41(4-5): 600–637.
Jackson, M. 2009. "Disadvantaged through Discrimination? The Role of Employers in Social Stratification." *The British Journal of Sociology* 60 (4): 669–692. doi:10.1111/j.1468-4446.2009.01270.x.
Kankaraš, M., G. Moors, and J. K. Vermunt. 2011. "Testing for Measurement Invariance with Latent Class Analysis." In *Cross-Cultural Analysis: Methods and Applications*, edited by E. Davidov, P. Schmidt, and J. Billiet, 359–384. New York, NY: Routledge.
Kureková, L. M., M. Beblavý, C. Haita, and A.E. Thum. 2016. "Employers' Skill Preferences across Europe: Between Cognitive and Non-cognitive Skills." *Journal of Education and Work* 29 (6): 662–687. doi:10.1080/13639080.2015.1024641.
Lauder, H., P. Brown, and S.Y. Cheung. 2018. "Fractures in the Education–economy Relationship: The End of the Skill Bias Technological Change Research Programme?" *Oxford Review of Economic Policy* 34 (3): 495–515. doi:10.1093/oxrep/gry008.
Lawton-Smith, H., and S. Bagchi-Sen. 2006. "University-industry Interactions: The Case of the UK Biotech Industry." *Industry and Innovation* 13 (4): 371–392. doi:10.1080/13662710601032697.
Le Grand, C. (2000) "On-the-job Training, Firm Resources and Unemployment Risks: An Analysis of the Swedish Recession 1991-1993." ECONSTOR Working Paper No. 2000(3).
Leuze, K. 2011. "Higher Education and Graduate Employment: The Importance of Occupational Specificity in Germany and Britain." In *Converging Worlds of Welfare?*, edited by J. Clasen, 245–265. Oxford: Oxford University Press.
Lucas, S.R. 2001. 'Effectively maintained inequality: Education transitions, track mobility, and social background effects'. *American Journal of Sociology* 106(6): 1642–1690.
Mayrhofer, W., C. Brewster, M.J. Morley, and J. Ledolter. 2011. "Hearing a Different Drummer? Convergence of Human Resource Management in Europe—A Longitudinal Analysis." *Human Resource Management Review* 21 (1): 50–67. doi:10.1016/j.hrmr.2010.09.011.
Miller, S. R., and J.E. Rosenbaum. 1997. "Hiring in a Hobbesian World: Social Infrastructure and Employers' Use of Information." *Work and Occupations* 24 (4): 498–523. doi:10.1177/0730888497024004006.

Morrison Gutman, L., and I. Schoon. 2013. *The Impact of Non-cognitive Skills on Outcomes for Young People*. London: Education Endownment Foundation and Cabinet Office.
Mouw, T. 2003. "Social Capital and Finding a Job: Do Contacts Matter?" *American Sociological Review* 68 (6): 868–898. doi:10.2307/1519749.
Muthén, B. O. 2004. *Mplus Technical Appendices*. Los Angeles: Muthen&Muthen.
Muthén, B. O., K. Shedden, and D. Spisic (1999). *General latent variable mixture modelling.Technical report*.
Pager, D., and L. Quillian. 2005. "Walking the Talk? What Employers Say versus What They Do." *American Sociological Review* 70 (3): 355–380. doi:10.1177/000312240507000301.
Park, J., and L. Lee. 2004. "Analysing Cognitive or Non-cognitive Factors Involved in the Process of Physics Problem-solving in an Everyday Context." *International Journal of Science Education* 26 (13): 1577–1595. doi:10.1080/0950069042000230767.
Perkins, R., and E. Neumayer. 2011. "Geographies of Educational Mobilities: Exploring Unevenness, Difference and Changes in International Student Flows." Working Paper, London: School of Economics & Political Science.
Petzold, K. 2020. "Heterogeneous Effects of Graduates' International Mobility on Employers' Hiring Intentions—experimental Evidence from Germany" *Higher Education*. *Online first*.
Piketty, T. 2014. *Capital in the 21st Century*. Cambridge: Harvard University Press.
Piopiunik, M., G. Schwerdt, L. Simon, and L. Woessmann (2018) "Skills, Signals, and Employability: An Experimental Investigation," IZA Discussion Papers, No. 11283, Institute of Labor Economics (IZA), Bonn
Protsch, P., and H. Solga. 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. doi:10.1093/esr/jcv056.
Raffiee, J., and R. Coff. 2016. "Micro-foundations of Firm-specific Human Capital: When Do Employees Perceive Their Skills to Be Firm-specific?" *Academy of Management Journal* 59 (3): 766–790. doi:10.5465/amj.2014.0286.
Ramos-Vielba, I., and M. Fernández-Esquinas. 2012. "Beneath the Tip of the Iceberg: Exploring the Multiple Forms of University–industry Linkages." *Higher Education* 64 (2): 237–265. doi:10.1007/s10734-011-9491-2.
Rivera, L.A. 2016. *Pedigree: How Elite Students Get Elite Jobs*. Princeton, NJ: Princeton University Press.
Schwarz, G. 1978. "Estimating the Dimensions of a Model." *The Annals of Statistics* 6 (2): 461–464. doi:10.1214/aos/1176344136.
Souto-Otero, M. 2007. Access to post-compulsory education and training: economic, sociological and political determinants and remaining research gaps. *Comparative Education* 43(4); 571–586.
Souto-Otero, M. 2010. Education, meritocracy and redistribution. *Journal of Education Policy* 25(3): 397–413.
Spence, M. 1973. "Job Market Signaling." *The Quarterly Journal of Economics* 87 (3): 355–374. doi:10.2307/1882010.
Stiglitz, J.E. 1975. "The Theory Of" Screening," Education, and the Distribution of Income." *The American Economic Review* 65 (3): 283–300.
Strathdee, R. C. 2008. *Tertiary Education in the 21 Century. Economic Change and Social Networks*. New York: Palgrave McMillan.
Streeck, W. (2011) "Skills and Politics. General and Specific," MPIfG discussion paper, No. 11/1, Max-Planck-Institut für Gesellschaftsforschung, Köln.
Tholen, G., P. Brown, S. Power, and A. Allouch. 2013. "The Role of Networks and Connections in Educational Elites' Labour Market Entrance." *Research in Social Stratification and Mobility* 34,: 142–154. doi:10.1016/j.rssm.2013.10.003.
Tomlinson, M. 2017. "Forms of Graduate Capital and Their Relationship to Graduate Employability." *Education+ Training* 59 (4): 338–352. doi:10.1108/ET-05-2016-0090.
Vermunt, J. K., and J. Magidson. 2002. "Latent Class Cluster Analysis." In *Applied Latent Class Analysis*, edited by J. A. Hagenaars and A. L. McCutcheon, 89–106, Cambridge: Cambridge University Press.
Vermunt, J. K. 2008. "Multilevel Latent Variable Modeling : An Application in Education Testing." *Austrian Journal of Statistics* 37 (3&4): 285–299.
Wellman, B., and K. Frank. 2001. "Network Capital in a Multi-level World: Getting Support from Personal Communities." In *Social Capital: Theory and Research*, edited by N. Lin, K. Cook, and R. Burt, 233–273. Hawthorne, NY: Aldine de Gruyter.