Heterogeneous effects of graduates' international mobility on employers' hiring intentions—experimental evidence from Germany

Knut Petzold¹

Published online: 7 April 2020

© The Author(s) 2020

Abstract

International student mobility (ISM) is considered increasingly important for professional careers. Referring to theories of human capital and job market signalling, we assume that different forms of ISM experience can serve as signals for general, specific and transnational human capital. To test this idea, we use a factorial survey experiment to investigate the weights HR managers of German employers allocate to ISM experience in hiring decisions, both generally and conditionally to other characteristics of the application. A screening situation was simulated by randomly presenting hypothetical applicants, thereby systematically varying ISM experience (no experience, private sojourn, studying abroad, internship abroad) and other graduates' characteristics ascribed and achieved. In contrast to the usual graduate and employer surveys, the experimental approach allows us to investigate employers' evaluations directly while capturing problems of endogeneity. Results show that while an internship abroad is more rewarded by employers than studying abroad or a private sojourn, good grades and occupation-specific professional experience are still the most important. Though the effects of ISM experience are partly independent of those of other characteristics, graduates with migration background and those with a master's degree benefit less from ISM experience. Moreover, ISM experience is more rewarded by employers who operate in international contexts. Overall, the analysis uncovers a heterogeneous signalling power of ISM experience, conditional to different types of human capital and to characteristics of applicants and employers.

Keywords Employer survey · Factorial survey experiment · International student mobility · Recruitment · Transnational human capital · Vignette experiment

---

✉ Knut Petzold
knut.petzold@hszg.de

¹ Faculty of Social Sciences, Hochschule Zittau/Görlitz - University of Applied Sciences, Görlitz, Germany

Introduction

International student mobility (ISM) is one of the most important ways to prepare university graduates for increasingly internationalised labour markets (cf. Gerhards et al. 2017). Benefits from ISM experience to individual careers are often taken for granted and students are typically motivated to go abroad by being pointed to enhanced labour market opportunities (e.g. Trower and Lehmann 2017). Accordingly, a steady growth of students who spent a period abroad is consistently reported, both globally and in Germany (OECD 2018). While the number of students who have gone abroad has increased by 1.8 million or 64% around the world, the share of German students who stay abroad temporarily has almost doubled to nearly 140,000 per year in the last decade (DAAD and DZHW 2018). However, the mostly implicit assumption that employers prefer graduates with ISM experience is hardly challenged by empirical investigations (cf. Waibel et al. 2017).

A number of studies examine the effects of ISM experience on foreign language proficiency, intercultural competences and open-mindedness, flexibility and adaptability or European identity and personal traits while assuming positive impacts on graduates' employability and careers (e.g. Williams 2005; Black and Duhon 2006; Shafteel et al. 2007; Zimmermann and Neyer 2013; Van Mol 2013; Salisbury et al. 2013; European Commission 2014). Another group of studies addresses the effects of ISM experience on graduates' employment probabilities or wages more directly, but with mixed evidence (e.g. Wiers-Jenssen and Try 2005; Messer and Wolter 2007; Parey and Waldinger 2011; Teichler 2011; Støren and Wiers-Jenssen 2010; Wiers-Jenssen 2011, 2013; Kratz and Netz 2018; Waibel et al. 2018; Jacob et al. 2019).

As labour market returns to ISM experience are directly based on the selection principles employers apply in their decisions to hire and pay graduates (cf. Breen et al. 1995), other studies use employer surveys and report differing findings. Some of them show that employers are looking for skills and experiences delivered through ISM when recruiting graduates and that many HR managers believe that ISM experience is clearly connected with higher employability, higher earnings and a higher chance to get leading positions (e.g. Bracht et al. 2006; Crossman and Clark 2010; Molony et al. 2011; European Commission 2014). Others point out that employers consider ISM experience to be rather unimportant compared to work experience, which reflects more general cognitive and social skills and occupation-specific knowledge (e.g. Trooboff et al. 2007; Archer and Davison 2008; Diamond et al. 2011). Accordingly, employers often prefer ISM that includes work experience such as internships abroad (e.g. Fielden et al. 2007; Van Mol 2017). ISM experience may also tip the scales when applicants show otherwise similar qualifications (Humburg and Van Der Velden 2015; DAAD and IW 2016). It has also been frequently reported that ISM experience is especially rewarded when employers need graduates with international competences and language skills, as is the case in international companies who are deeply involved in international trade relations (e.g. Trooboff et al. 2007; DAAD and IW 2016; Petzold 2017a, b).

The most important methodological problem when examining the labour market returns to ISM concerns the issue of students spending a period abroad being highly selective in terms of their professional orientations (Netz 2015), their mobility capital (Wiers-Jenssen 2013), their personality traits (Zimmermann and Neyer 2013), their attitudes towards occupation or international moving (Williams 2005) and, primarily, their high socio-economic background (e.g. Brooks and Waters 2010; Netz and Finger 2016; Lörz et al. 2016). Students' self-selection into ISM results in confounder problems that jeopardise the estimation of the causal effects

ISM experience exerts on individual careers. Hence, empirical studies must rule out alternative explanations to ensure that labour market success is causally related to ISM experience (cf. Morgan and Winship 2015).

When using graduate surveys to estimate causal effects, group characteristics of students with and without ISM experience are typically balanced after data collection based on observed variables. Economists often apply instrumental variables yet report ambiguous evidence (Messer and Wolter 2007; Parey and Waldinger 2011; Di Pietro 2015; Sorrenti 2017). However, the underlying ‘exclusivity assumption’ that the instrument is only correlated with the labour market outcomes through the ISM treatment can typically not be proved. Sociologists increasingly use matching approaches (Waibel et al. 2018; Iriondo 2019; Liwiński 2019), where labour market outcomes of graduates with and without ISM experience are matched for comparison, based on similar observed characteristics. However, bias resulting from unobserved heterogeneity cannot be ruled out.

By contrast, we adopted an experimental design in this study (cf. Shadish et al. 2002). In a factorial survey experiment with employers (Rossi and Anderson 1982; Jasso 2006; Auspurg and Hinz 2015), vignettes of hypothetical applicants with varied higher education credentials were randomly presented to HR managers of German employers. As graduates’ characteristics are balanced and confounders with employers’ characteristics are neutralised, the approach bears three specific potentials. First, it allows for a direct investigation of employers’ evaluations of graduates’ characteristics in a simulated screening situation, where the causal effects of graduates’ ISM experience on hiring intentions can be identified. Second, the design permits the exploration of interactions between graduates’ ISM experience and their other ascribed and achieved characteristics. Third, cross-level interactions between graduates’ ISM experience and employer characteristics can be examined.¹

The study is focussed on Germany, where ISM experience is reported to be less important for employers’ than in Eastern and Southern European countries (cf. Humburg and Van Der Velden 2015; Van Mol 2017). Studies comparing European countries revealed that labour market returns to ISM are positively associated with a poorer quality of tertiary education and higher unemployment rates among university graduates, both of which is not true for Germany (Rodrigues 2013; Jacob et al. 2019). School-to-work transitions are comparatively smooth and fast in Germany (e.g. Levels et al. 2014), because there is a high standardisation and occupational specificity in higher education (e.g. Müller 2005) and a high demand for highly skilled employees. Additional signals such as ISM experience may thus be less important. Therefore, the German institutional context allows for a rather conservative test of the gains ISM may provide in recruitment processes. On the other hand, Germany’s economy is clearly export-oriented (cf. DAAD and IW 2016), which throws up the question as to how specifically ISM experience comes into play.

In sum, this study completes the growing body of experiments on employers’ selection decisions in recruitment processes both in general (e.g. De Wolf and Van Der Velden 2001; Di Stasio 2014; Protsch and Solga 2015; Damelang and Abraham 2016) and with a specific focus on the role of ISM experience (Humburg and Van Der Velden 2015; Petzold 2017a, b). It sheds light on the extent to which ISM experience is perceived as a signal of general, specific, or transnational human capital by employers in the recruiting process.

¹ In principle, interactions between graduates’ and employers’ characteristics can also be analysed using conventional survey data. A special feature of factorial surveys is, however, that hierarchical and balanced data are achieved, enabling less biased estimates.

Theoretical background

Transitions from higher education to work can generally be understood as matching processes between applicants' skills and the requirements of employers, typically based on mutual evaluations (Kalleberg and Sorensen 1979; Müller 2005). Human capital theory and job market signalling theory are two of the most prominent approaches to specify graduates' labour market allocations (cf. Weiss 1995; Bills 2003).

Higher education and job assignment

According to human capital theory, employers will reward employees' job productivity in terms of wage offers (Mincer 1958; Becker 1964). Education is an investment in one's stock of human capital, which refers to the total of one's skills, knowledge and abilities. Trained graduates will be more productive and will therefore be rewarded more by employers. Students anticipate potential wage benefits and feel motivated to acquire higher education and professional work experience. Accordingly, educational characteristics of graduates, such as study degree, graduation, professional experience and ISM experience, can be understood as investments in one's stock of human capital.

However, the human capital approach must be criticised for the assumption that students make their decision on the basis of complete information about the lifelong benefits of education. Education does not necessarily lead to their higher productivity, which may already exist. The approach also neglects information asymmetry between employers and applicants, as individual properties entailing job performance are sometimes not directly observable. In order to reduce employers' uncertainty when screening and filtering applicants, job seekers may acquire signals that provide information about their unobservable performance (Spence 1973; Arrow 1973; Stiglitz 1975). As the acquisition of job market signals requires costly investments that are assumed to be negatively correlated with job seekers' unobservable traits such as their productivity, these graduates have a higher tendency to gain a signal.

Irrespective of the mechanisms, both approaches imply equal predictions: the most highly and most intensively educated applicants will be the most productive and will provide reliable educational credentials that help employers to filter and to pay them (Bills 2003; Müller 2005). Sorting job seekers to jobs based on processes of applicants' signalling and employers' screening can therefore be understood as an extension of the human capital theory, as this draws attention to the role of unobservable traits in hiring processes (cf. Weiss 1995).

Unlike with signals that can be acquired, an applicant cannot do much about unalterable observable attributes, such as gender or migration background. These may also be considered in screening processes. Screening by such indices² is highly consistent with the theory of statistical discrimination, where employers judge applicants' individual characteristics based on beliefs about characteristics of the social groups they belong to, instead of individual merits (Phelps 1972; Arrow 1998). Graduates achieved signals and their unalterable indices are screened by employers, as they allow for estimating relevant but unobserved traits and properties.

² The term 'indices' is employed with reference to signalling and discrimination theories, not in the sense of summarised indices as used in statistical analysis.

Three types of human capital

Given the aim of this study, it is purposeful to distinguish between general human capital, specific human capital and transnational human capital. *General human capital* is typically understood as the stock of knowledge and skills that increases individuals' job performance in a general way and should hence be rewarded by most employers. Even if the match between the field of study and job profile is not perfect, employers will value general skills and traits such as a reasonable level of perseverance, ability to learn, organisational skills or diligence. Also, traits such as self-confidence, decisiveness, serenity, teamwork skills or analytical skills will be generally attributed to higher education and rewarded by employers (e.g. Archer and Davison 2008; DAAD 2011; DAAD and IW 2016). In line with the importance of general human capital, degrees and good grades are regularly reported as being significant for employers (e.g. Behrenz 2001; De Wolf and Van der Velden 2001).

Specific human capital refers to the stock of specific knowledge and particular skills that represent individuals' expertise in specific professional fields that can be applied only with certain employers or jobs. Accordingly, specific human capital will be rewarded conditionally in respect of suitable jobs by suitable employers (e.g. Weiss 1995; Bills 2003). Given a suitable field of study, knowledge and skills regarding working processes, special materials, tools, programs and so on will especially be acquired by training on the job, as for example by internships. Accordingly, professional work experience relevant to the job at hand is reported as being quite attractive for employers (e.g. Behrenz 2001; Di Stasio 2014; Humburg and Van Der Velden 2015; DAAD 2011; DAAD and IW 2016).

Transnational human capital refers to the stock of knowledge and skills that enable individuals to deal in different fields beyond their own nation-state (Gerhards and Hans 2013; Gerhards et al. 2017; Jacob et al. 2019). This concerns how familiar graduates are with the institutions of education, work and the economy in a foreign country, through knowledge of formal and informal social norms and language skills. It can also concern the access to information abroad.³ Transnational human capital is typically acquired through stays abroad. Many studies have shown that international experiences are positively related to individuals' foreign language proficiency, the ability to cope with different cultures, inter-cultural adaptability and sensitivity, global mindedness, knowledge about a foreign country or pertinent international networks (Williams 2005; Shaftel et al. 2007; Crossman and Clark 2010; Salisbury et al. 2013; European Commission 2014). These forms of knowledge and skills are primarily applicable in international working contexts. Transnational human capital will thus be primarily rewarded by multinational employers or in international tasks and assignments (cf. Petzold 2017a, b). This argument is supported by the observation that graduates with international experience are particularly likely to work abroad after graduation (e.g. Parey and Waldinger 2011), in multinational companies (e.g. Kratz and Netz 2018) and in jobs with international tasks (Bracht et al. 2006; Wiers-Jenssen 2008, Wiers-Jenssen 2013).⁴

³ In a similar way, one could also conceptualise national human capital, which would refer to the stock of knowledge and skills that enables individuals to deal in the mentioned fields in their own nation state.

⁴ Transnational human capital can be regarded as both a third type of human capital and a subtype of general human capital, depending on whether knowledge about foreign countries and foreign language skills are valued by most employers or only by specific ones, which is ultimately an empirical question. The distinction between general and transnational human capital is purposeful because it sharpens our analytical view on what is crucial with ISM experience as a kind of education.

Hypotheses

Successful sorting and job-matching results from interactive signalling and screening processes, so that it is purposeful to consider both applicants' signals/indices and employers' needs. The German labour market is characterised by high levels of stratification, standardisation and occupational specificity (Müller 2005; Breen 2005), which guarantee a comparatively low variance between university graduates nationwide and the high signalling power of certificates (cf. Allmendinger 1989; Levels et al. 2014). As a result, employers will consider other characteristics for selection, as for instance the degree level, applicants' migration background or ISM experience. Our core argument is that employers will evaluate ISM experience differently, first, according to how various forms of ISM are differently related to the three types of human capital; second, according to further characteristics of the applicant and third, according to their own needs.

A private stay abroad such as a long international journey without additional education or professional work will train students to deal with societal and cultural circumstances different from those in their home country, reflecting a high level of transnational human capital. In contrast, studying abroad will enhance one's general and specific human capital in addition to transnational human capital, because students have to cope with conditions in a foreign country and also to study courses to gain professional knowledge and skills. Additionally, if students complete an internship with a certain employer in a foreign country, they will increase their specific human capital even more, compared to when they study abroad. Accordingly, while we assume that all forms of ISM experience should make employers more inclined to hire a candidate, the effect of an internship abroad would be strongest and the effect of a private stay abroad the weakest (hypothesis 1).⁵

Moreover, it is very likely that potential effects of ISM on employers' hiring intentions will interact with further characteristics of an applicant, i.e. their status as a migrant or non-migrant, and their university degree.⁶ Regardless of their individual skills, migrants often show a higher risk of and longer durations of unemployment (e.g. Kogan 2006), indicating that the graduate's migration background works as an index for employers. Applicants with a migration background might be credited with an innately higher level of transnational human capital by employers, i.e. foreign language skills and intercultural competence. As a result, migrants might not benefit from ISM experience, unless it contributes to further general or specific human capital. We assume that the effects of ISM experience on employers' hiring intentions should be stronger among non-migrants than among migrants (hypothesis 2).

In contrast, a certain level of general and specific human capital may be attributed to the university degree obtained. Since a master's degree already signals general and specific human capital, candidates will benefit from ISM experience primarily because of the transnational human capital signalled. In turn, applicants with a bachelor's degree will benefit more from ISM experience, because of additionally signalled general and specific human capital. We assume that the effects of ISM experience on employers' hiring intentions should be stronger among applicants with a bachelor's degree than among those with a master's degree (hypothesis 3).

⁵ Of course, students can also attend study courses in their home country, thus building up general and specific human capital. The teaching at home may also be of better quality than that in foreign countries, which is an interesting avenue for future research. However, this study is primarily about how ISM is linked to human capital.

⁶ Interactions of studying abroad with job seekers' graduation and professional experience have already been examined elsewhere (Petzold 2017a).

Transnational human capital should be particularly attractive for employers who operate in international contexts, i.e. those who have offices, subsidiaries, partners, consumers or suppliers abroad. The reason is that they benefit more from employees' competencies to cope with international working environments. Earlier studies have indeed shown that skills and knowledge, typically associated with transnational human capital, are perceived as being especially valuable by employers with clear international orientation (DAAD and IW 2016; Van Mol 2017). Accordingly, we assume that the effects of ISM experience on hiring intentions will be stronger among employers with foreign branches than among those without foreign branches (hypothesis 4).

Method and data

As in a recent precursor study (Petzold 2017a), we use the experimental design of a factorial survey (e.g. Rossi and Anderson 1982; Jasso 2006) to investigate how employers' hiring intentions are influenced by applicants' ISM experience. The main methodological challenge in studying the effect of ISM on labour market returns is the selectivity of mobile graduates in terms of gender (e.g. Salisbury et al. 2010; Böttcher et al. 2016), socio-economic background (e.g. Lörz et al. 2016; Netz and Finger 2016), personality traits (Zimmermann and Neyer 2013), academic skills and literacy (Salisbury et al. 2013), inter-cultural communication skills (Williams 2005), mobility capital (Wiers-Jenssen 2013) and professional orientations (Netz 2015). Graduates with ISM experience also select themselves into big and international companies (e.g. Kratz and Netz 2018) and into jobs with international tasks (Bracht et al. 2006; Wiers-Jenssen 2008, Wiers-Jenssen 2013). As ISM experience occurs together with other characteristics of graduates or employers that are likewise crucial for the labour market success, its effects must be isolated.

When using graduate surveys or employer studies to estimate the effect of ISM experience, this so-called endogeneity bias is neutralised after data collection through statistical analyses. However, as survey data are often not structured by specific research interests, there is mostly a lack of available information, forcing researchers to use proxy variables. In the case of graduate surveys, assumptions about employers' decision-making are often tested only indirectly (e.g. Kratz and Netz 2018). In the case of employer studies, responses to retrospective questioning may be blurred by cognitive memory processes (e.g. Crossman and Clark 2010).

Principles of experimentation

In contrast, experiments address endogeneity bias already during data collection. Treatment variables are systematically varied across comparison groups, and subjects are randomly assigned to these groups, in order to detect differences in outcome variables (cf. Campbell and Stanley 1963; Shadish et al. 2002). As a result of such variation and randomisation, balanced treatment variables are not confounded with one another and are not confounded with observed and unobserved characteristics of the study participants. As experimental designs ensure that independent variables are exogenous, they are appropriate to test for causal relationships between treatments and outcomes (cf. Morgan and Winship 2015). Compared to conventional surveys, experiments also allow for a more nuanced, detailed and comprehensive investigation of principles in decision-making (cf. Goldthorpe 1996).

The validity of treatment effects on outcomes is typically evaluated in terms of three major criteria (Campbell and Stanley 1963; Shadish et al. 2002, 38): *Construct validity* addresses

inferences about the higher-order constructs represented by sampling particulars, such as measures of treatment and outcome. *Internal validity* refers to inferences about whether a covariation between treatment and outcome reflects a causal relationship. *External validity* focuses on inferences about whether a revealed causal relationship can be extrapolated to other units, settings, treatments or outcomes.

Ideally, the results of a study provide high levels of internal, external and construct validity. Construct validity should be adequately ensured, since otherwise, no meaningful conclusions can be drawn. The more detailed and direct theoretical constructs are operationalised, the less necessary are additional assumptions regarding their representation and the stronger would the construct validity be. Internal validity is indispensable for testing theoretical explanations, while external validity can never be finally determined. Though random sampling of study elements provides the highest level of external validity, purposive sampling of heterogeneous or typical instances can also enhance external validity (Shadish et al. 2002).⁷

Factorial survey approach

In a factorial survey experiment, a hypothetical decision problem is described in vignettes, while treatment variables (dimensions) are systematically varied at different levels, so that each vignette consists of a unique description of the decision problem. Vignettes are then randomly distributed across respondents for judgement. In the factorial survey, the principles of experimentation and the principles of surveying are combined (cf. Auspurg and Hinz 2015). In our study, varying hypothetical applicants were randomly presented to HR managers in order to simulate a screening situation and to measure intentions for hiring.

One advantage when exploring hiring intentions using factorial survey experiments is that complex vignette descriptions allow for simulating a realistic decision problem, where HR managers have to weigh the importance of various graduates' characteristics and prioritise their importance. This serves as a more direct testing of theoretical assumptions. As relevant information is presented equally to all respondents in vignettes, the response process is less prone to distortions through individual interpretations (cf. Shamon et al. 2019). Accordingly, factorial survey experiments enable a high level of construct validity.

Further, correlations between treatments and between treatments and respondents' characteristics are avoided through balanced variation. Hypothetical graduates show not only typical combinations of educational features and ascribed characteristics but also do not select themselves into companies, so that HR managers are confronted also with applications they would eventually not receive in the real world. For these reasons, factorial survey experiments make for a high level of internal validity. At the same time, it is also possible to choose study elements based on random, heterogeneous or typical sampling, or to replicate them with another sample. Factorial survey experiments thus have a high potential for external validity (see Mutz 2011).

---

⁷ Formal probability sampling is usually recommended to achieve a high level of generalisation. However, the requirements to define a clearly specified target population and to generate lists of units from which samples can be drawn with known probability can often not be fulfilled. In this case, according to Shadish et al. (2002, 23–24), more informal purposive sampling can be used for facilitating generalisation. While heterogeneous instances can be chosen deliberately to reflect diversity on presumptively important dimensions, typical instances to which one most wants to generalise can be selected based on theoretical considerations. Although these sampling strategies are not backed by statistical analyses justifying generalisations, they are especially practical when formal probability sampling is impossible. In this study, we paid particular attention to sufficient heterogeneity in the sample of employers.

However, the major criticism of factorial survey experiments is that situations presented and intentions reported are only hypothetical. Vignettes cannot depict the entire complexity of a decision problem (Hughes and Huby 2004), so that perhaps not all possible information is provided, which may become relevant for real behaviour. If the perception of behavioural incentives or restrictions differs between hypothetical vignettes and equivalent real-world situations (e.g. Collett and Childs 2011), the reported intentions will also differ from real behaviour.⁸

Accordingly, the *behavioural validity* of vignettes refers to inferences about whether causal relationships between hypothetical treatments on behavioural intentions can be extrapolated to relationships between real conditions on the actual behaviour of (other) subjects (cf. Petzold and Wolbring 2019). Yet, some studies validating intentions measured with vignettes by real behaviour conclude that essentially, reality-based decisions are made even in hypothetical situations. For decisions on helping behaviour in everyday life (Eifler 2010), the naturalisation of migrants (Hainmueller et al. 2015), or even ethnic discrimination among university students (Petzold and Wolbring 2019), it has been demonstrated that at least the direction and relative strength of treatment effects could be replicated with vignette experiments.

In sum, a factorial survey experiment allows for a direct and detailed investigation of the employers' selection considerations and for unbiased estimations of ISM effects on hiring intentions, both directly and in interaction with characteristics of the applicant and the employer. Nevertheless, the specific study particulars regarding sampling and measures have to be taken into account when interpreting the results.

Employer sample

Data were collected in spring 2015 with an online survey (CAWI) titled 'Applications to entry positions—what matters?' A comprehensive list of German employers from which a random sample can be drawn is not available. Therefore, a heterogeneous and convenient respondent sample is used in line with previous research on the legally and ethically sensitive topic of recruiting management by means of an experimental design (e.g. Di Stasio 2014).

We collected employers' e-mail addresses from job offers in online portals⁹ and the federal agency for work and aimed for heterogeneity regarding company size and region, while only including employers with headquarters in Germany. Only job offers of positions for graduates or for young professionals with a few years of working experience were considered. Each employer has been invited only once, regardless of the number of jobs offered.

From 1203 employers invited via valid e-mail addresses, 205 (17.04%) visited the welcome page, which informed them about the study and its purpose. One hundred fourteen (9.48%) respondents finished the questionnaire. After cleaning data of total or partial item non-response, 101 (8.40%) managers who reported hiring intentions regarding 795 hypothetical applications were included in the analysis.

Table 1 details employers' characteristics and reveals that we achieved a heterogeneous yet selective sample of employers. About three quarters is active in trading and service, while one quarter operates in the area of industry. About one half has foreign branches. Companies from

⁸ The design also has further shortcomings such as the possibility to construct illogical cases or the rise of learning and fatigue effects, yet primarily if vignettes are very complex and among older respondents (Sauer et al. 2011).

⁹ Online job-portals: jobboerse.arbeitsagentur.de, StepStone.de, monster.de, jobturbo.de, absolventa.de, jobconsult.com, job24.de, stellenanzeigen.de, jobscout24.de, jobs.de, jobbörse.de

Table 1 Employers' characteristics

Employers' characteristics	M (SD)/Percent	Range
Age	34.52 (37.96)	0–201
Size	1601.54 (5966.79)	3–50,000
Sector		0–1
Trading/service	75.25	
Industry/production	24.75	
Region		1–16
Baden-Württemberg	16.83	0–1
Bayern	28.71	0–1
Berlin	4.95	0–1
Brandenburg	0.99	0–1
Bremen	2.97	0–1
Hamburg	4.95	0–1
Hessen	7.92	0–1
Mecklenburg-Vorpommern	0.99	0–1
Niedersachsen	6.93	0–1
Nordrhein-Westfalen	12.87	0–1
Rheinland-Pfalz	1.98	0–1
Saarland	0.99	0–1
Sachsen	0.99	0–1
Sachsen-Anhalt	0.99	0–1
Thüringen	1.98	0–1
Other country	4.95	0–1
Foreign branches		0–1
No foreign branches	47.52	
Foreign branches	52.48	
N _{respondents}	101	
N _{vignettes}	795	

Germany's Southern states are strongly represented, whereas those from the Northern and the Eastern parts are less included, which roughly reflects the economic circumstances in Germany.

Managers' characteristics are shown in Table 2. The respondents are mostly female, from the Western part of Germany, in a relationship and have completed higher education. More than three quarters have claimed to be responsible for own employees. Around one-fifth shows own ISM experience.

Though the composition of the sample is plausible for human resource managers, it is selective. Small and medium-sized employers with foreign branches, operating in trading and service, are overly represented in the sample, limiting the external validity of the study. Nonetheless, due to the experimental approach, the characteristics of companies and managers do not influence effect estimations of the varied vignette dimensions. As can be noted from Table 6 in the appendix, a stepwise inclusion of characteristics of managers and companies as covariates in the estimation model does not lead to substantial changes in vignette treatment effects, which reflects a successful randomisation of vignettes across employers.

Experimental design

Dimensions and levels varied in the vignettes are shown in Table 3. As former studies have revealed, employers typically consider applicants' formal qualification expressed by their degree, graduation and professional experience. They also consider less standardised credentials such as voluntary

Table 2 Managers' characteristics

Managers' characteristics	M (SD)/Percent	Range
Age	39.95 (11.37)	21–71
Gender		0–1
Male	38.61	
Female	61.39	
Region of birth		1–3
Former Western Germany	78.22	0–1
Former Eastern Germany	14.85	0–1
Other country	6.93	0–1
Marital status		1–6
Single	28.71	0–1
In relation/married	62.28	0–1
Living apart	1.98	0–1
Divorced	6.93	0–1
Education		1–6
Secondary school	3.96	0–1
High school	8.91	0–1
Professional training	6.93	0–1
Higher education	74.26	0–1
PhD	3.96	0–1
Other	1.98	0–1
Own ISM experience		1–5
No stay abroad	45.54	0–1
Stay abroad	21.78	0–1
Years in company	6.64 (7.02)	0–39
Accountability		0–1
No accountability	23.76	
Accountability	76.24	
N _{respondents}	101	
N _{vignettes}	795	

engagement or professional referrals from other employers (e.g. Behrenz 2001; De Wolf and Van Der Velden 2001; Humburg and Van Der Velden 2015). In addition, we varied applicants' gender and migration background as ascribed characteristics to uncover potential interactions. Finally, as it is our particular research interest, we varied ISM experience at the levels 'No stay abroad', 'Private stay abroad', 'Studying abroad' and 'Internship abroad'. These levels aim to signal different stocks of general, specific and transnational human capital.

As not all characteristics that managers potentially consider in hiring decisions could be varied in the experiment for the sake of complexity, we fixed some relevant information when introducing the vignettes. Respondents were asked to imagine applications from fresh higher-education graduates for typical entry positions in their company. All applications were already judged suitable in terms of formal qualification and job requirements. All graduates are to be imagined with an age typical for a labour market entry in the respective industry.

The Cartesian product of all dimensions and levels results in 1152 vignettes, each describing one unique graduate. As not all hypothetical graduates from the perfectly balanced and uncorrelated full-factorial design could be presented to human resource managers in the questionnaire, a D-efficient sample of 144 vignettes was drawn (D-efficiency = 96.55). Using the modified Federov search algorithm, the optimal solution between a maximum zero-correlation of the dimensions (orthogonality) and a maximum variance of the levels (level balance) in the vignette sample was identified (cf. Kuhfeld et al. 1994; Dülmer 2016). As intended, all vignette dimensions are very well balanced (Appendix Table 4) and nearly zero-

Table 3 Variation of applicants' characteristics on dimensions and levels

Dimensions	Levels			
	0	1	2	3
Gender	Male	Female		
Migration background	No migrant	Migrant		
Degree	Bachelor	Master		
Graduation	Below average	Average	Above average	
Professional experience	No experience	General exp.	Specific exp.	
Voluntary engagement	No engagement	Engagement		
Professional referral	No referral	Referral		
ISM	No stay abroad	Private stay	Studying abroad	Internship abroad

correlated (Appendix Table 5). Again, considering level balance and orthogonality, sampled vignettes were systematically distributed to 18 decks with eight vignettes each. The decks were randomly assigned to HR managers, who were presented the eight vignettes in a random order, so as to neutralise learning and fatigue effects.

Translations of the vignette text and subsequent questions are depicted in Fig. 1 (see Appendix Fig. 7 for an original vignette example). Respondents were asked to report three intentions regarding the candidate described, each on an 11-point scale. For reasons of complexity, only the second question is considered for analysis: 'How likely are you to hire this candidate in your company?' The response scale for this intention ranged from 'in no case' (− 5) to 'definitely' (5), while no position of the slider was specified previously at the response scale.¹⁰

Estimation methods

Each manager assessed up to eight applications, so that the data structure is hierarchical (Hox et al. 1991; Jasso 2006). To consider the multi-level structure, we used random intercept fixed slope models, which account for the variation in the outcome variable between respondents (e.g. Snijders and Bosker 2012). Due to the rather small size of the decks, only the intercept is estimated with a random component, while possible non-modelled heteroscedasticity is corrected by robust standard errors (Huber-White).¹¹

$$I_{ij} = \beta_0 + \beta_1 ISM_{ij} + \beta_2 X_{ij} + \gamma Z_j + \nu_j + \varepsilon_{ij}; i = 1, \dots, n; j = 1, \dots, m$$

I_{ij}	Intention of manager/employer j to hire applicant i
ISM_{ij}	international student mobility varied in applications
X_{ij}	vector of other characteristics varied in applications
Z_j	vector of manager/employer characteristics

¹⁰ Rating scales are recommended for factorial survey experiments in general (see Auspurg and Hinz 2015, 69). A number of 11 response categories provide a sufficient differentiation between vignettes, while preventing censored responses. Rating scales are therefore commonly used in contemporary factorial survey experiments with employers (e.g. Di Stasio 2014; Damelang and Abraham 2016; Petzold 2017a). The approach differs from related choice experiments, where vignettes are presented simultaneously for selection (e.g. Humburg and Van Der Velden 2015).

¹¹ Though a convenient, yet heterogeneous, sample was used, we report confidence intervals for reasons of convention and to facilitate interpretation. It must be noted that the confidence intervals do not reflect the generalizability of the results beyond the sample.

Personal characteristics of the application

The application for the entry position in your company shows the following characteristics:

- Man / Woman with / without immigration background
- Bachelor / Master
- Graduation below average / average / above average
- No professional / Professional experience, occupationally specific / though not occupationally specific
- No stay / Longer private stay / Studying / Internship abroad
- No voluntary / Voluntary engagement
- No personal / Personal referral

How likely are you to invite this candidate to a job interview?

In no case
|
|
 Definitely

How likely are you to hire this candidate in your company?

In no case
|
|
 Definitely

What salary would you be willing to pay?

-50%
|
|
 average salary | +50%

Fig. 1 Vignette text and questions (translation)

ν_j error term at manager/employer level

ε_{ij} error term at vignette level

In addition to the main effect of ISM levels across all vignettes, we are interested in the weights managers attribute to ISM, conditional on the levels of migration background and university degree. Hence, we included interaction terms between the ISM dimension and these dimensions ($X_{ij}ISM_{ij}$):

$$I_{ij} = \beta_0 + \beta_1 ISM_{ij} + \beta_2 X_{ij} + \gamma Z_j + \delta X_{ij} ISM_{ij} + \nu_j + \varepsilon_{ij}; i = 1, \dots, n; j = 1, \dots, m$$

Finally, we wanted to estimate the weights attributed to ISM by employers with and without foreign branches. For this purpose, we included cross-level interactions (Auspurg and Hinz 2015, 99) between the ISM dimension and employers' branch variable ($Z_i ISM_{ij}$). As characteristics of managers and employers are not randomly assigned to employers, all presented estimation results are controlled for covariates at the respondent level.¹²

$$I_{ij} = \beta_0 + \beta_1 ISM_{ij} + \beta_2 X_{ij} + \gamma Z_j + \delta Z_i ISM_{ij} + \nu_j + \varepsilon_{ij}; i = 1, \dots, n; j = 1, \dots, m$$

Results

Figure 2 shows the distribution of the intentions to hire applicants across all presented vignettes. It is markedly symmetrical with a mean value near the midpoint of the scale and reasonable variance ($M = -0.69$; $SD = 2.40$; $Skewness = -0.10$). This indicates that the dimensions varied were relevant for the managers and also justifies the use of linear estimation models.

¹² As a robustness check, group specific models, i.e. by degree, migration background and foreign branches have been estimated without substantially differing results.

Fig. 2 Distribution of hiring intentions across all vignettes

In hypothesis 1, we proposed positive effects of ISM experience on managers' hiring intentions. However, as a private stay abroad should be primarily associated with an enhanced stock of transnational human capital, its effect should be the weakest. In turn, an internship abroad should signal all types of human capital and should therefore have the strongest impact, while the effect of studying abroad should be somewhere in between. As expected, employers tend to hire applicants who have ISM experiences with a greater probability than those who do not, while the effect of an internship abroad is the strongest and the effect of a private stay abroad is the weakest. The analysis thus clearly supports hypothesis 1.

However, it also becomes clear from Fig. 3 that credentials such as one's graduation and specific professional experience are much more important for managers' hiring intentions, than ISM experience. ISM experience is weighted quite similar to a master's degree (as compared to a bachelor's degree), having experience as a volunteer, general professional experience, or to a personal referral. It is worth mentioning the negative effect of the migration background, which clearly points to ethnic discrimination, even though only hypothetical applicants were judged.

We further argued in hypothesis 2 that applicants with migration background should benefit less from ISM experience than non-migrants.¹³ As depicted in Fig. 4, migrants do not profit at all from a private stay abroad and hardly from studying abroad. Only an internship abroad is weighted similarly as with non-migrants. In turn, for those without migration background, fairly equal effects are found for all three ISM forms. This suggests that non-migrants do profit from ISM through a growth in transnational human capital, while migrants do not. Once again, the analysis clearly confirms hypothesis 2.

In hypothesis 3, we claimed that ISM effects should be smaller for applicants with a master's degree than for applicants with a bachelor's degree. As shown in Fig. 5, studying abroad and an internship abroad are clearly rewarded by employers when applicants hold a bachelor's degree, whereas those with a master's degree do not seem to profit from studying

¹³ Although migrants are a minority in reality, they are presented in about the half of all vignettes as a result of the balanced experimental variation. This ensures the comparability of the ISM effects and the related standard errors across both groups.

Fig. 3 Main effects of applicants' characteristics on hiring intentions

abroad. Even though the differences in the effect sizes are not statistically significant and somewhat unexpected regarding a private stay abroad, the smaller effects of studying abroad and an internship for those with a master's degree largely supports hypothesis 3.

Referring to a greater utility of transnational human capital for employers operating in international contexts, we stated in hypothesis 4 that employers with foreign branches will attribute more weight to ISM experience than those without foreign branches. Estimation results

Fig. 4 Effects of ISM experience conditional on applicants' migration background

Fig. 5 Effects of ISM experience conditional on applicants' degree

shown in Fig. 6 support this idea. Managers affiliated with an employer with foreign branches are consistently more inclined to hire a candidate providing ISM experience than those who represent an employer without foreign branches. While all effects of ISM experience become statistically significant for the first, none of the effects become statistically significant for the latter. For these, only an internship abroad is valuable to some extent, which is very likely driven by specific human capital. In sum, the analysis provides clear support of hypotheses 4.¹⁴

Fig. 6 Effects of ISM experience conditional on employers' foreign branches

¹⁴ Results of models including all interaction terms, i.e. beyond ISM experience, will be provided by the author upon request.

Discussion and conclusions

In this study, we examined how international student mobility (ISM) is weighted by HR managers of German employers when they consider hiring graduates for entry positions. Referring to human capital theory and the job market signalling theory, ISM experience can serve as a signal for general, specific and transnational human capital. The key argument of this study is that ISM will be valued depending on how different ISM forms are related to these types of human capital. The ISM effect should also vary conditional on applicants' further characteristics and employers' needs.

In a factorial survey experiment, hypothetical graduates with varying characteristics have been randomly presented to respondents, to measure hiring intentions in a simulated screening situation. The experimental approach permits a direct investigation of the relative weights HR managers attribute to graduates' ascribed characteristics, educational credentials and ISM experiences when hiring. ISM effects were also examined conditional on characteristics of other applicants and employers.

The results show, first, that all the three forms of ISM under investigation, i.e. a private stay abroad, studying abroad and an internship abroad, enhanced the intentions of managers to hire the presented applicants. As expected, a private stay abroad is less rewarded, whereas an internship abroad seems to be most beneficial, though the differences are rather small and not statistically significant. This indicates that the importance of ISM depends on how it is related to general, specific and transnational human capital.

However, compared to other credentials, ISM experience appears to be less important. This is especially true of one's graduation and occupation-specific working experience, which show the strongest effects. Yet, it must also be noted that these credentials require significantly more effort than a stay abroad. It may be surprising that a formal master's degree is not assigned more weight than ISM. Yet, it has to be considered that the master's degree effect reflects the difference from a bachelor's degree, whereas the ISM effect reflects the difference from the case of no stay abroad.

Second, ISM experience is less important for graduates with an migration background who would benefit only from an internship abroad but not from studying abroad or a private stay, while non-migrants would benefit nearly equally from all forms of ISM. This suggests that ISM experience partly signals transnational human capital. If transnational human capital is already made observable through other characteristics such as migration background, ISM experience becomes less important and is primarily rewarded based on additionally acquired specific human capital. In turn, even if no general or specific human capital is signalled, as in a private stay abroad, the signalling value of transnational human capital remains for non-migrants.¹⁵

Third, though not statistically significant, compared to those with a bachelor's degree, master's degree holders would benefit less from studying abroad and an internship abroad, but slightly more from a private stay abroad. Similar to non-migrants, master's degree holders may profit from signalled transnational human capital in the case of a private stay abroad. In the case of an internship abroad, they may also profit from additionally signalled specific human capital. For holders of a bachelor's degree, studying abroad and an internship abroad exert stronger effects, probably because of the comparatively stronger signalling power regarding

¹⁵ In the models, the migration background shows a significant interaction solely with ISM experience. All other academic credentials of migrants and non-migrants were similarly rewarded by employers.

general and specific human capital. Hence, ISM experience may signal general and specific human capital, especially when this is not reflected through other characteristics.

Finally, if employers have foreign branches, graduates' ISM experience has consequently larger effects (yet not significantly), which indicates a relatively higher value of transnational human capital for internationally oriented employers. For these, inter-cultural communication skills and knowledge about institutions and norms of certain foreign societies appear to be more beneficial than for others, so that they attribute more weight to all forms of ISM experience, as transnational human capital is always signalled.¹⁶

In sum, our results largely confirm the findings of previous studies that employers primarily reward occupation-specific knowledge acquired through work experience (e.g. Trooboff et al. 2007; Archer and Davison 2008; Diamond et al. 2011), that internships abroad are on average valued higher than studying abroad (e.g. Fielden et al. 2007; Van Mol 2017) and that ISM experience is especially favoured by international companies (e.g. Trooboff et al. 2007; DAAD and IW 2016; Petzold 2017a, b). The latter is also in line with results from graduate surveys, which revealed clear associations between ISM experience and employment in multinational companies (e.g. Parey and Waldinger 2011; Wiers-Jenssen 2008, Wiers-Jenssen 2013; Kratz and Netz 2018). The results thus reinforce the insight that the value of ISM should not be over-generalized. Instead, its effect depends on various individual and contextual conditions. In this respect, the study contributes to research on the heterogeneity of ISM effects.

While there is a broad consensus that factorial survey experiments guarantee a high level of internal validity through variation and randomisation (cf. Mutz 2011; Auspurg and Hinz 2015), the scope of results is always limited (Shadish et al. 2002). And even though detailed and nuanced information is provided in vignettes, they do not replicate reality (cf. Hughes and Huby 2004), which has implications for construct validity.

Not all potential determinants of hiring behaviour can be varied in factorial survey experiments; but the design is primarily useful if the treatments reflect the most important drivers of decision-making. Too much or too little information varied in vignettes can make respondents tend to use heuristics to form their intentions, rather than bestow serious consideration (cf. Shamon et al. 2019). Consequently, we varied graduates' characteristics, which are reported to be the most important in the empirical literature and which are the most crucial in terms of our theoretical considerations. Yet, of course, employers' hiring decisions depend on even more determinants, i.e. applicant's age, language proficiency, or a company's recruitment policy.

One may also criticise that we draw on comparably rough categorisations. For instance, migrants are a very heterogeneous social group, differing in their countries of origin, motivations and experiences. ISM experience could also be differentiated much further, i.e. concerning the destination country, duration of stay or between credit and degree mobility. It was also not specified to what extent ISM experience was relevant to a specific job. It is conceivable that ISM experience will be assessed differently depending on the job requirements within the same company. How ISM effects would differ across different host countries, different durations or different study subjects is a question that remains open. Also, the quality of study courses attended may differ significantly between foreign countries and Germany, which had to be disregarded in this study. To take research forward, it is thus desirable to vary

¹⁶ Our analyses also indicate that there may be gender differences in the importance of ISM experience in the recruitment behaviour of employers. It is conceivable that the mechanisms of signalling the different types of human capital work differently for men and women. However, since this was not subject of our current investigation, it would deserve more attention in the future.

a number of additional characteristics of graduates or to vary the same characteristics on more levels.

In the same way, the baseline categories used can be discussed. Though it is usual to construct vignette levels relative to one another, as ‘below average’, ‘average’ and ‘above average’, it is not entirely clear as to how respondents interpret this information. It is possible that the baseline below average will be taken as a signal of very poor performers in the sense of threshold effects of education (cf. Protsch and Solga 2015). In this case, bad credentials would be more significant for HR managers than good ones. If threshold effects exist, the solely meritocratic view of higher education is cancelled out to some extent. Accordingly, the reported effects should always be interpreted carefully and with respect to the related levels within the same vignette dimension. Treatment effects should be compared with caution across different dimensions. Future investigations could pay more attention to a greater harmonisation of the basic categories and, particularly, to threshold effects.

Finally, the external validity is especially limited in terms of the sample used and the hypothetical outcome. Though we aimed for purposive sampling on employer heterogeneity (Shadish et al. 2002), the sample is convenient and selective, as it was not randomly drawn from a register and HR managers themselves decided to participate. Even though we reported confidence intervals for reasons of convention and interpretability, they do not reflect the extent to which the results can be generalised beyond the sample used. As the mechanisms that underlie hiring behaviour might be moderated by respondents’ characteristics (cf. Auspurg and Hinz 2015, 64), it remains largely open to what extent the results can be extrapolated to other employers and HR managers. For instance, Waibel et al. (2018) report positive effects of ISM experience on socio-economic status only for graduates of occupationally unspecific fields, such as humanities or social sciences, while there are no returns observed for graduates of occupationally specific fields, such as medicine or engineering. It would thus be promising to replicate the experiment with particular focus on the role of different branches, sectors or national economies.

The hiring situation was simulated only by presenting hypothetical graduates, which concerns the behavioural validity of the results. The extent to which the estimated ISM effects can also be found regarding employers’ hiring behaviour in the real world remains unknown. Yet, existing validation studies proposed that though the absolute levels of hypothetical and real-world social behaviour differ, at least the relative strength and directions of treatment effects can be replicated with vignettes (e.g. Eifler 2010; Hainmueller et al. 2015; Petzold and Wolbring 2019).

Overall, our study contributes to the discussion about how HR managers evaluate graduates’ ISM experience in selection decisions. It also demonstrates the strength and weakness of the application of experimental designs in higher education research. The fact that many questions remained necessarily open in this study (e.g. how well applicants perform in job interviews or whether ISM experience will unfold long-term effects at later stages in career), calls urgently for further research validating the results by employers’ real recruitment behaviour. Because of its complementary character, using experimental designs more extensively in research on higher education seems highly promising to us, particularly with regard, but not limited to, determinants and effects of ISM experience.

Funding Information Open Access funding provided by Projekt DEAL.

Compliance with ethical standards Data were collected using an online-survey among German employers who were invited via e-mail and gave their informed consent that researchers can analyse the collected data for scientific purposes. The common Ethics Commission of the German Sociological Association (DGS/GSA) and the Professional Association of German Sociologists (BDS) gave ethical approval for data collection.

Conflict of interest The author declares that they have no conflict of interest.

Appendix

116

Steckbrief Bewerbung

Die Bewerbung auf eine Einstiegsposition in Ihrem Unternehmen weist folgende Merkmale auf:

- Mann mit Migrationshintergrund
- Master
- Studienabschluss unterdurchschnittlich
- praktische Erfahrung, jedoch nicht berufsspezifisch
- längerer privater Auslandsaufenthalt
- kein ehrenamtliches Engagement
- auf persönliche Empfehlung

Wie wahrscheinlich würden Sie diese Person zu einem Bewerbungsgespräch einladen?
(Bitte unter die Leiste klicken)

Auf gar keinen Fall Auf jeden Fall

Wie wahrscheinlich würden Sie diese Person in Ihrem Unternehmen einstellen?

Auf gar keinen Fall Auf jeden Fall

Welches Gehalt wären Sie bereit zu zahlen?

- 50%   - 40%   - 30%   - 20%   - 10%   durchschnittliches Gehalt   + 10%   + 20%   + 30%   + 40%   + 50%

Zurück Weiter

Fig. 7 Vignette example

Table 4 Frequencies of vignette dimensions (estimation sample)

Applicants' characteristics	Number	Percent	Level
Gender			
Male	389	48.93	0
Female	406	51.07	1
Migration background			
No migrant	399	50.19	0
Migrant	396	49.81	1
Degree			
Bachelor	400	50.31	0
Master	395	49.69	1
Graduation			
Grade below average	256	32.20	0
Grade average	271	34.09	1
Grade above average	268	33.71	2
Professional experience			
No experience	261	32.83	0
General professional experience	271	34.09	1
Specific professional experience	263	33.08	2
Voluntary engagement			
No engagement	396	49.81	0
Engagement	399	50.19	1
Personal referral			
No personal referral	400	50.31	0
Personal referral	395	49.69	1
International student mobility (ISM)			
No stay abroad	199	25.03	0
Private stay abroad	198	24.91	1
Studying abroad	199	25.03	2
Internship abroad	199	25.03	3
N _{vignettes}	795	100	

Table 5 Correlations between dimensions (estimation sample)

	1	2	3	4	5	6	7	8
1 Gender	1.000							
2 Migration background	0.0190	1.000						
3 Degree	0.0215	−0.0189	1.000					
4 Graduation	−0.0345	0.0497	0.0001	1.000				
5 Professional experience	0.0185	−0.0527	−0.0155	0.0267	1.000			
6 Voluntary engagement	−0.0089	−0.0490	0.0340	−0.0590	−0.0155	1.000		
7 Professional referral	0.0215	−0.0642	−0.0063	0.0032	−0.0898	0.0239	1.000	
8 ISM	−0.0276	−0.0231	0.0208	−0.0028	−0.0152	0.0298	−0.0264	1.000

Table 6 Effects on hiring intention (stepwise estimation)

	Hiring intention		
Applicants' characteristics			
Female (ref. male)	0.075 (0.115)	0.072 (0.115)	0.074 (0.115)
Migration background (ref. no)	− 0.211 (0.115)	− 0.210 (0.115)	− 0.212 (0.115)
Master (ref. Bachelor)	0.290* (0.115)	0.287* (0.115)	0.285* (0.115)
Graduation (ref. below average)			
Grade average	1.126*** (0.142)	1.127*** (0.142)	1.122*** (0.142)
Grade above average	1.924*** (0.142)	1.922*** (0.142)	1.919*** (0.142)
Professional experience (ref. no)			
General experience	0.420** (0.141)	0.423** (0.141)	0.424** (0.141)
Specific experience	1.851*** (0.143)	1.849*** (0.143)	1.847*** (0.143)
Voluntary engagement (ref. no)	0.406*** (0.115)	0.404*** (0.115)	0.403*** (0.115)
Personal referral (ref. no)	0.565*** (0.115)	0.565*** (0.115)	0.564*** (0.115)
International student mobility (ref. no)			
Private stay abroad	0.356* (0.162)	0.353* (0.162)	0.354* (0.162)
Studying abroad	0.520** (0.161)	0.518** (0.161)	0.519** (0.161)
Internship abroad	0.637*** (0.161)	0.636*** (0.161)	0.635*** (0.161)
Managers' characteristics			
Age		0.008 (0.019)	0.006 (0.020)
Female (ref. male)		− 0.128 (0.310)	0.036 (0.343)
Marital status (ref. single)			
In relation/married		0.433 (0.380)	0.755 (0.390)
Living apart		0.733 (1.064)	0.883 (1.012)
Divorced		− 0.102 (0.715)	− 0.191 (0.698)
Education (ref. sec. school)			
High school		1.571 (0.856)	1.578 (0.879)
Professional training		0.195 (0.885)	0.238 (0.866)
Higher education		0.571 (0.756)	0.706 (0.732)
PhD		− 0.720 (1.077)	− 0.362 (1.207)
Other		0.409 (1.250)	0.210 (1.210)
Region of birth (ref. former Western Ger.)			
Former Eastern Germany		0.207 (0.432)	0.767 (0.471)
Other country		0.266 (0.561)	0.400 (0.570)
Own ISM experience (ref. no)			
Study abroad		0.072 (0.437)	− 0.139 (0.465)
Internship abroad		− 0.044 (0.480)	− 0.292 (0.479)
Other stay abroad		0.489 (0.406)	0.210 (0.419)
Accountability for staff (ref. no)		− 0.588 (0.366)	− 0.545 (0.369)
Years in company		0.002 (0.026)	− 0.012 (0.032)
Employers' characteristics			
Age			0.003 (0.005)
Size			− 0.000 (0.000)
Industry/production (ref. trading/service)			− 0.643 (0.384)
Region company (ref. Baden-Württemberg)			
Bayern			− 0.421 (0.453)
Berlin			− 0.809 (0.701)
Brandenburg			− 0.828 (1.745)
Bremen			− 0.697 (0.898)
Hamburg			− 0.601 (0.707)
Hessen			− 0.926 (0.608)
Mecklenburg-Vorp.			− 0.937 (1.448)
Niedersachsen			− 0.775 (0.699)
Nordrhein-Westf.			− 0.874 (0.542)
Rheinland-Pfalz			− 0.367 (1.167)
Saarland			0.418 (1.406)

Table 6 (continued)

Hiring intention			
Sachsen			– 3.013* (1.471)
Sachsen-Anhalt			– 2.772 (1.479)
Thüringen			– 1.211 (1.097)
Other country			– 0.801 (0.763)
Foreign branches (ref. no)			– 0.240 (0.356)
Constant	1.979*** (0.249)	1.183 (1.031)	1.798 (1.102)
σ_v	1.351*** (0.113)	1.260*** (0.107)	1.147*** (0.101)
σ_ε	1.604*** (0.043)	1.604*** (0.043)	1.604*** (0.043)
Log Likelihood	– 1598.8762	– 1592.8317	– 1585.0336
LR χ^2	335.56***	347.65***	363.25***
$N_{\text{vignettes}}$	795	795	795
$N_{\text{respondents}}$	101	101	101

Random intercept maximum likelihood estimation; unstandardized coefficients, robust standard errors in parentheses

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

References

- Allmendinger, J. (1989). Educational systems and labor market outcomes. *European Sociological Review*, 5(3), 231–250.
- Archer, W., & Davison, J. (2008). *Graduate employability: what do employers think and want?* London: The Council for Industry and Higher Education.
- Arrow, K. (1973). Higher education as a filter. *Journal of Public Economics*, 2(3), 193–216.
- Arrow, K. J. (1998). What has economics to say about racial discrimination? *Journal of Economic Perspectives*, 12(2), 91–100.
- Auspurg, K., & Hinz, T. (2015). *Factorial Survey Experiments (Vol. 175, quantitative applications in social sciences)*. London/Thousand Oaks: Sage Publications.
- Becker, G. S. (1964). *Human capital: a theoretical and empirical analysis, with special reference to education*. Chicago: Chicago University Press.
- Behrenz, L. (2001). Who gets a job and why? An explorative study of employers' recruitment behavior. *Journal of Applied Economics*, 4(2), 255–278.
- Bills, D. B. (2003). Credentials, signals, and screens: explaining the relationship between schooling and job assignment. *Review of Educational Research*, 73(4), 441–449.
- Black, T. H., & Duhon, D. L. (2006). Assessing the impact of business study abroad programs on cultural awareness and personal development. *Journal of Education for Business*, 81(3), 140–144.
- Böttcher, L., Araújo, N. A. M., Nagler, J., Mendes, J. F. F., Helbing, D., & Herrmann, H. J. (2016). Gender gap in the ERASMUS mobility program. *PLoS One*, 11(2), e0149514.
- Bracht, O., Engel, C., Janson, K., Over, A., Schamburg, H., & Teichler, U. (2006). *The professional value of ERASMUS mobility. Final report*. Brussels: European Commission.

- Breen, R. (2005). Explaining cross-national variation in youth unemployment. Market and institutional factors. *European Sociological Review*, 21(2), 125–134.
- Breen, R., Hannan, D. F., & O'Leary, R. (1995). Returns to education: taking account of employers' perceptions and use of educational credentials. *European Sociological Review*, 11(1), 59–73.
- Brooks, R., & Waters, J. L. (2010). Social networks and educational mobility: the experiences of UK students. *Globalisation, Societies and Education*, 8(1), 143–157.
- Campbell, D. T., & Stanley, J. C. (1963). *Experimental and quasi-experimental designs for research*. Chicago: Rand-McNally.
- Collett, J. L., & Childs, E. (2011). Minding the gap: meaning, affect, and the potential shortcomings of vignettes. *Social Science Research*, 40(2), 513–522.
- Crossman, J. E., & Clark, M. (2010). International experience and graduate employability: stakeholder perceptions on the connection. *Higher Education*, 59(5), 599–613.
- DAAD (Ed.). (2011). *Bachelor und Master auf dem Arbeitsmarkt: Die Sicht deutscher Unternehmen auf Auslandserfahrungen und Qualifikationen*. Bonn: DAAD.
- DAAD, & IW (Eds.). (2016). *Hochschulabsolventen mit Auslandserfahrungen auf dem deutschen Arbeitsmarkt*. Bonn: DAAD.
- DAAD, & DZHW (Ed.). (2018). *Wissenschaft weltweit. Daten und Fakten zur Internationalität von Studium und Forschung in Deutschland*. Bielefeld: wbv.
- Damelang, A., & Abraham, M. (2016). You can take some of it with you! A vignette study on the acceptance of foreign vocational certificates and ethnic inequality in the German labor market. *Zeitschrift für Soziologie*, 45(2), 91–106.
- De Wolf, I., & Van Der Velden, R. (2001). Selection processes for three types of academic jobs. An experiment among Dutch employers of social sciences graduates. *European Sociological Review*, 17(3), 317–330.
- Di Pietro, G. (2015). Do study abroad programs enhance the employability of graduates? *Education, Finance and Policy*, 10(2), 223–243.
- 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.
- Diamond, A., Walkley, L., Forbes, P., Hughes, T., & Sheen, J. (2011). *Global Graduates into Global Leaders*. London: The Council for Industry and Higher Education.
- Dülmer, H. (2016). The factorial survey. Design selection and its impact on reliability and internal validity. *Sociological Methods & Research*, 45(2), 304–347.
- Eifler, S. (2010). Validity of a factorial survey approach to the analysis of criminal behavior. *Methodology European Journal of Research Methods for the Behavioral and Social Sciences*, 6(3), 139–146.
- European Commission. (2014). *The ERASMUS impact study: Effects of mobility on the skills and employability of students and the internationalisation of higher education institutions*. Luxembourg: Publications Office of the European Union.
- Fielden, J., Middelhurst, R., & Woodfield, S. (2007). *Global horizons for UK students*. London: The Council for Industry and Higher Education.
- Gerhards, J., & Hans, S. (2013). Transnational human capital, education, and social inequality. *Analyses of international student exchange. Zeitschrift für Soziologie*, 42(2), 99–117.
- Gerhards, J., Hans, S., & Carlson, S. (2017). *Social class and transnational human capital. How Upper and Middle Class Parents Prepare Their Children for Globalization*. London: Routledge.
- Goldthorpe, J. H. (1996). The quantitative analysis of large-scale data-sets and rational action theory: for a sociological alliance. *European Sociological Review*, 12(2), 109–126.
- Hainmueller, J., Hangartner, D., & Yamamoto, T. (2015). Validating vignette and conjoint survey experiments against real-world behavior. *Proceedings of the National Academy of Sciences*, 112(8), 2395–2400.
- Hox, J. J., Kreft, I. G., & Hermkens, P. L. J. (1991). The analysis of factorial surveys. *Sociological Methods & Research*, 19(4), 439–510.
- Hughes, R., & Huby, M. (2004). The construction and interpretation of vignettes in social research. *Social Work and Social Sciences Review*, 11(1), 36–51.
- Humburg, M., & Van Der Velden, R. (2015). Skills and the graduate recruitment process: evidence from two discrete choice experiments. *Economics of Education Review*, 49, 24–41.
- Iriondo, I. (2019). Evaluation of the impact of Erasmus study mobility on salaries and employment of recent graduates in Spain. *Studies in Higher Education*. <https://doi.org/10.1080/03075079.2019.1582011>.
- Jacob, M., Kühnert, M., & Rodrigues, M. (2019). Labour market returns to Graduates' International experience: exploring cross-country variation in Europe. *European Sociological Review*, 35(4), 491–505.

- Jasso, G. (2006). Factorial survey methods for studying beliefs and judgements. *Sociological Methods & Research*, 34(3), 334–423.
- Kalleberg, A. L., & Sorensen, A. B. (1979). The sociology of labor markets. *Annual Review of Sociology*, 5, 351–379.
- Kogan, I. (2006). Labor markets and economic incorporation among recent immigrants in Europe. *Social Forces*, 85(2), 697–721.
- Kratz, F., & Netz, N. (2018). Which mechanisms explain monetary returns to international student mobility? *Studies in Higher Education*, 43(2), 375–400.
- Kuhfeld, W. F., Tobias, R. D., & Garratt, M. (1994). Efficient experimental design with marketing research applications. *Journal of Marketing Research*, 31(4), 545–557.
- Levels, M., Van Der Velden, R., & 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.
- Liwiński, J. (2019). Does studying abroad enhance employability? *The Economics of Transition*, 27(2), 409–423.
- Lörz, M., Netz, N., & Quast, H. (2016). Why do students from underprivileged families less often intend to study abroad? *Higher Education*, 72(2), 153–174.
- Messer, D., & Wolter, S. C. (2007). Are exchange programs worth it? *Higher Education*, 54(5), 647–663.
- Mincer, J. (1958). Investment in human capital and personal income distribution. *Journal of Political Economy*, 66(4), 282–302.
- Molony, J., Sowter, B., & Potts, D. (2011). *QS Global Employer Survey Report 2011. How employers value an international study experience*. London: OS Intelligence Unit.
- Morgan, S. L., & Winship, C. (2015). *Counterfactuals and causal inference: methods and principles for social research* (2nd ed.). Cambridge: Cambridge University Press.
- Müller, W. (2005). Education and youth integration into European labour markets. *International Journal of Comparative Sociology*, 46(5/6), 461–485.
- Mutz, D. C. (2011). *Population-based survey experiments*. Princeton: Princeton University Press.
- Netz, N. (2015). What deters students from studying abroad? Evidence from four European countries and its implications for higher education policy. *Higher Education Policy*, 28(2), 151–174.
- Netz, N., & Finger, C. (2016). New horizontal inequalities in German higher education? Social selectivity of studying abroad between 1991 and 2012. *Sociology of Education*, 89(2), 79–98.
- OECD (2018). *Education at a glance: OECD-indicators*. Paris: OECD Publishing.
- Parey, M., & Waldinger, F. (2011). Studying abroad and the effect on international labour market mobility: Evidence from the introduction of ERASMUS. *The Economic Journal*, 121(551), 194–222.
- Petzold, K. (2017a). The role of international student mobility in hiring decisions. A vignette experiment among German employers. *Journal of Education and Work*, 30(8), 893–911.
- Petzold, K. (2017b). Studying abroad as a sorting criterion in the recruitment process. A field experiment among German employers. *Journal of Studies in International Education*, 21(5), 412–430.
- Petzold, K., & Wolbring, T. (2019). What can we learn from factorial surveys about human behavior? A validation study comparing field and survey experiments on discrimination. *Methodology European Journal of Research Methods for the Behavioral and Social Sciences*, 15(1), 19–30.
- Phelps, E. S. (1972). The statistical theory of racism and sexism. *American Economic Review*, 62(4), 659–661.
- 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.
- Rodrigues, M. (2013). Does student mobility during higher education pay? Evidence from 16 European countries. *JRC Scientific and Policy Reports*. <https://doi.org/10.2788/95642>.
- Rossi, P. H., & Anderson, A. B. (1982). The factorial survey approach: an introduction. In P. H. Rossi & S. L. Nock (Eds.), *Measuring social judgments. The factorial approach* (pp. 15–67). Beverly Hills et al.: Sage Publications.
- Salisbury, M. H., Paulsen, M. B., & Pascarella, E. T. (2010). To see the world or stay at home: applying an integrated student choice model to explore the gender gap in the intent to study abroad. *Research in Higher Education*, 51(7), 615–640.
- Salisbury, M. H., An, B. P., & Pascarella, E. T. (2013). The effect of study abroad on intercultural competence among undergraduate college students. *Journal of Student Affairs Research and Practice*, 50(1), 1–20.
- Sauer, C., Auspurg, K., Hinz, T., & Liebig, S. (2011). The application of factorial survey in general population samples: the effect of respondent age and education on response times and response consistency. *Survey Research Methods*, 5(3), 89–102.
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Houghton Mifflin Company: Boston / New York.
- Shafel, J., Shafel, T., & Rohini, A. (2007). International educational experience and intercultural competence. *International Journal of Business and Economics*, 6(1), 25–34.

- Shamon, H., Dülmer, H., & Giza, A. (2019). The factorial survey: the impact of the presentation format of vignettes on answer behavior and processing time. *Sociological Methods & Research*. <https://doi.org/10.1177/0049124119852382>.
- Snijders, T. A. B., & Bosker, R. J. (2012). *Multilevel analysis. An introduction to basic and advanced multilevel modeling*. Los Angeles: Sage.
- Sorrenti, G. (2017). The Spanish or the German apartment? Study abroad and the acquisition of permanent skills. *Economics of Education Review*, 60, 142–158.
- Spence, M. (1973). Job market signaling. *Quarterly Journal of Economics*, 87(3), 355–374.
- Stiglitz, J. E. (1975). The theory of “screening,” education, and the distribution of income. *The American Economic Review*, 65(3), 283–300.
- Støren, L. A., & Wiers-Jenssen, J. (2010). Foreign diploma versus immigrant background: determinants auf labor market successor failure? *Journal of Studies in International Education*, 14(1), 29–49.
- Teichler, U. (2011). International dimensions of higher education and graduate employment. In J. Alle & R. Van Der Velden (Eds.), *The flexible professional in the knowledge society: new challenges for higher education* (pp. 177–198). Dordrecht: Springer.
- Trooboff, S., Vande Berg, M., & Rayman, J. (2007). Employer attitudes toward study abroad. *Frontiers: The Interdisciplinary Journal to Study Abroad*, 15, 17–33.
- Trower, H., & Lehmann, W. (2017). Strategic escapes: negotiating motivations of personal growth and instrumental benefits in the decision to study abroad. *British Educational Research Journal*, 43(2), 275–289.
- Van Mol, C. (2013). Intra-European student mobility and European identity: a successful marriage? *Population, Space and Place*, 19(2), 209–222.
- Van Mol, C. (2017). Do employers value international study and internships? A comparative analysis of 31 countries. *Geoforum*, 78(1), 52–60.
- Waibel, S., Rüger, H., Ette, A., & Sauer, L. (2017). Career consequences of transnational educational mobility: a systematic literature review. *Educational Research Review*, 20(1), 81–98.
- Waibel, S., Petzold, K., & Rüger, H. (2018). Occupational status benefits of studying abroad and the role of occupational specificity – a propensity score matching approach. *Social Science Research*, 74, 45–61.
- Weiss, A. (1995). Human capital vs. signalling explanations of wages. *Journal of Economic Perspectives*, 9(4), 133–154.
- Wiers-Jenssen, J. (2008). Does higher education attained abroad lead to international jobs? *Journal of Studies in International Education*, 12(2), 101–130.
- Wiers-Jenssen, J. (2011). Background and employability of mobile vs. non-mobile students. *Tertiary Education and Management*, 17(2), 79–100.
- Wiers-Jenssen, J. (2013). Degree mobility from the Nordic countries: background and employability. *Journal of Studies in International Education*, 17(4), 471–491.
- Wiers-Jenssen, J., & Try, S. (2005). Labour market outcomes of higher education undertaken abroad. *Studies in Higher Education*, 30(6), 681–705.
- Williams, T. R. (2005). Exploring the impact of study abroad on student’s intercultural communication skills: Adaptability and sensitivity. *Journal of Studies in International Education*, 9(4), 356–371.
- Zimmermann, J., & Neyer, F. J. (2013). Do we become a different person when hitting the road? Personality development of sojourners. *Journal of Personality and Social Psychology*, 105(3), 515–530.

Publisher’s note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.