Determinants of Job Search Success of German Agricultural Sciences Graduates

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Abstract

This paper shows how job search success, measured as search duration and entry salary, is affected directly or indirectly by personal and process as well as structural characteristics. A specific focus is on the relevance of practical experience which is claimed to be a key feature of employability. While self-assessed practical and namely international experience is positively related to salary, but not to search duration, the number and duration of internships does not affect job search success. Results are relevant for higher education institutions to develop their curricula, for students to prepare for job search, and for employers to understand the genesis of employability and their potential means to impact it.

Key words: talent management; employability; practical experience; search behaviour; ordinal regression

Introduction

Human Resource Management literature suggests an increasing excess demand for high potential employees, or "a shortage of talent" (Meyers & van Woerkom, 2014). Talent management, understood as "the systematic utilization of HRM activities to attract, identify, develop, and retain individuals who are considered to be 'talented'" (Meyers & van Woerkom, 2014, p. 192), therefore gains in importance. This also holds for agribusiness firms: The International Food and Agribusiness Management Association devoted a Special Issue on the Development of Human Capital in Agribusiness (Shelman & Connolly, 2012). Duerksen (2012) therein explicitly subscribes to the notion of a "war for talent", which was put forward originally by a McKinsey-study in the late 1990ies .

For Higher Education Institutions, this trend is at once good news and a challenge: in an increasingly dynamic world, educational programs have to be adapted to match graduate skills with the needs of corporations. A recent large-scale McKinsey survey suggests that there might have evolved a gap between expectations and self-perceptions of the performance of HEI in this respect (McKinsey, 2012), with companies and students doubting the value of higher education in providing the skills and knowledge needed for a successful career.

Little evidence so far exists how the shortage of talent affects job opportunities of graduates from agricultural sciences programs. There are some studies dealing with the expectations of various stakeholders, including practitioners, to specific study programs, such as agricultural communications (Sprecker & Rudd, 1997). However, measures of actual job search success are not included in these studies. The research question guiding this article therefore is:

What determines job search success of graduates from agricultural programs?

Answers to the above questions are sought through data from a nation-wide survey among graduates of agricultural sciences in Germany. Job search success is operationalized as duration of job search and level of entry salary (Kanfer, Wanberg, & Kantrowitz, 2001). The research model is mainly built on two relevant research streams in human resource management and education research, which focus on employability (Harvey, 2001), and search behaviour (Kanfer et al., 2001), respectively. As Kanfer et al. (2001) conclude that there is a lack of studies taking into account quality of employment, type of employment, and satisfaction, these variables are introduced in this survey as well.

The following section provides insights into the state of the art of research in related fields. Hypotheses on determinants of job search success are developed in the same place. Next, the strategy of data collection and analysis as well as the sample is described, followed by a section on results. These are discussed against the background of talent management challenges to both industry and universities in a further section. The contributions to the literature are wrapped up and avenues of future research are proposed in a short conclusion.

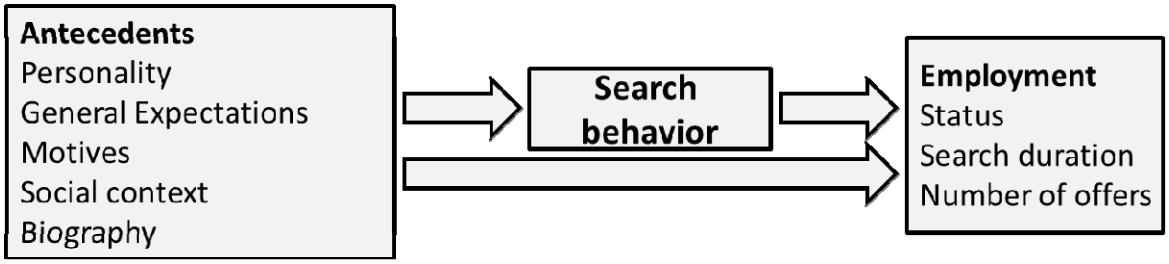
1 Literature Review and generation of hypotheses

1.1 Employability and search behaviour as determinants of job search success

A number of studies have dealt with job search success, namely in the US (Boswell, Zimmerman, & Swider, 2012; Kanfer et al., 2001). Typical strands of literature are labour economics, human resource management, and general management, with theoretical backgrounds in human capital theory, personnel psychology, and organizational psychology, but also sociology and new institutionalism (Cai, 2013).

In a meta-analysis of respective studies, Kanfer et al. (2001) distinguish between general antecedents, job search behaviour, and employment outcomes, where the antecedents influence outcomes both directly and indirectly through search behaviour (Figure 1). Antecedents considered are personality traits, expectations, self-evaluations, motives, social context, and biographical variables. Employment outcomes are most often measured in terms of status, search duration, and number of offers (Kanfer et al., 2001).

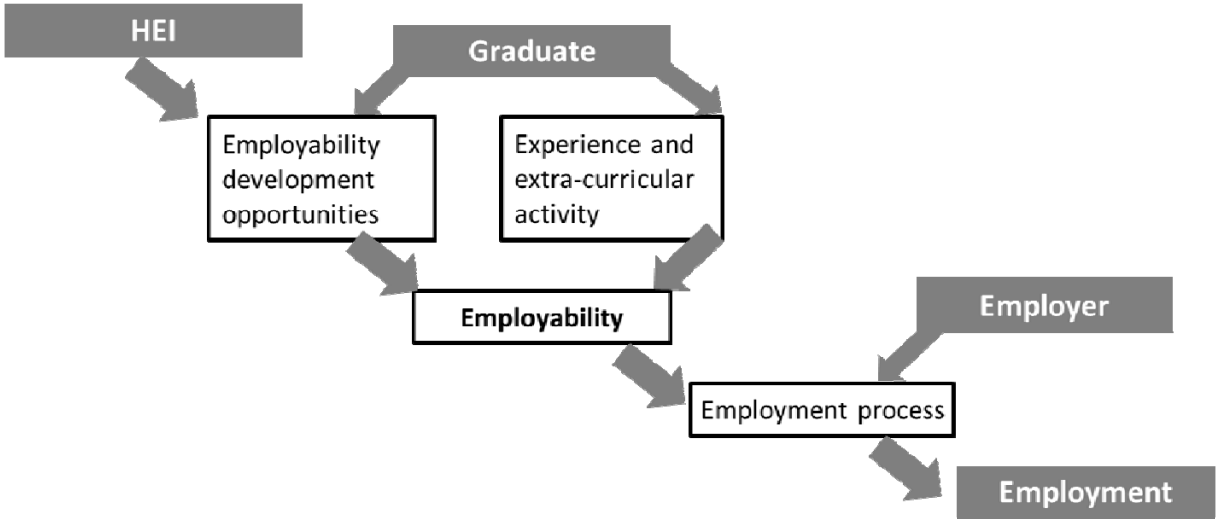
Figure 1: Determinants and outcomes of search behaviour



Source: Kanfer et al. (2001), modified

Another stream of research focuses on graduates' "employability", which is typically understood as "the ability of a graduate to obtain a job" (Harvey, 2001), although no common definition seems to exist so far (ibid). Since there is a clear link to attributes of graduates which are valuable to employers, graduates' employability is a crucial goal for higher education institutions (HEI) to guide their curriculum development. Also students preparing for job search, and employers seeking to identify their potential means to impact it, need to understand the genesis of employability. As shows Figure 2, employability can be conceptualized as the result of both HEI's ability to provide employability development opportunities, and graduate characteristics and efforts, including their extra-curricular experiences such as internships. It also shows, however, that employability is not identical with employment. Rather, its' impact on employment is mediated by the employment process and thus by the employers.

Figure 2: A model of employability development and employment



Source: Harvey (2001), p. 102

Most of the available studies in the field focus on unemployed persons, with a strong focus on new entrants, namely university graduates (Boswell et al., 2012). For graduates from agricultural programs, however, empirical evidence is almost non-existent.

Following the above described models, the next subsections provide hypotheses for the relevance of HEI and graduate characteristics, and job search behaviour for job search success. The further procedure, however, first requires a short excursus to introduce the German higher education system.

1.2 Excursus: Higher education institutions in Germany: Universities and Universities of Applied Sciences

Approaching the question of job search success of agricultural sciences graduates requires a short sketch of the system of higher education in Germany. Two types of universities can be distinguished. The classical universities are primarily dedicated to basic research and thus offer more theoretical study programs than universities of the applied sciences (UAS; Fachhochschulen) which have a stronger focus on application-oriented knowledge transfer (HRK 2015). This means that, in UAS, courses aim more at the competence of applying existing knowledge and not at generating new knowledge. Typically, in agricultural sciences, their curricula also are focused on farming and less on upstream or downstream sectors of agribusiness. Traditionally, the duration of studies at UAS was shorter than at universities, at least in agricultural sciences. With the introduction of Bachelor and Master programs, however, these differences might vanish: First, in the past decade, most of the study programmes have been switched from the old Diplom degree to Bachelor and Master degrees, as was foreseen in the Bologna process. Unfortunately, this has taken place in a continuous process, meaning that there is not, across all universities and UAS, a single structural break. Since the study programmes were changed considerably due to the framework of the ECTS system, some universities and UAS also adapted their internship regulations.

1.3 Dimensions of employability

1.3.1 HEI type

Although differences between the labour markets for graduates from the two types of HEI are intuitively conceivable, there is a lack of empirical evidence as to how strongly they actually differ. Generally it is claimed that, corresponding to the higher acquisition of human capital, entry salaries for university graduates should be higher than those for graduates from UAS. From the industry, the higher (trained) ability of university graduates to think abstractly often is stressed as a major advantage over UAS graduates when aiming at higher positions. This study will therefore test the basic hypothesis, that:

H1: Graduates from universities receive higher entry salaries than graduates from UAS when entering the agribusiness sector.

1.3.2 Study performance

Besides HEI type, study performance has to be considered an important criterion in the employment decision: As showed a linked-panel study by Kampelmann and Rycx (2012), there is a clear positive relationship between the level of required education and firm productivity. And additional hypothesis therefore is:

H2: Study performance (duration of studies, grades, combination of courses) (a) reduces search duration and (b) positively affects entry salary.

1.3.3 Science and practice: the great divide?

The question of scientific versus practical orientation has to be further elaborated, since practical experience is one of employers' crucial requirements. According to a recent report by McKinsey (2012), 32% of interviewed

employers in Germany report a lack of skills as reason for entry-level vacancies (USA: 45%, UK: 30%), while 47% of German youth thinks that their post-secondary studies did not improve their employment opportunities. Consequently, employers have an increasing stake in educational programs, where their future employees' skills are developed (Maxwell, Scott, Macfarlane, & Williamson, 2010; McKinsey, 2012). A strong academic focus of research and courses at universities could lead to an increasing gap between science and practice, making it more difficult for university graduates to understand practical problems and develop appropriate solutions. Here, extra-curricular experiences come into play (Harvey, 2001):

Traditionally, internships or even prior vocational training have been prerequisites for students to enter agricultural sciences programs, also in universities. Over the years, these prerequisites have been more and more reduced in universities to lower entry barriers for non-farm kids. The UAS still have included ample compulsory internships in their programs. Thus, concerns as to the practical orientation and background knowledge might arise namely of university graduates.

Since a prior vocational training implies that a candidate has invested substantially more time in personal skill development, and since the skills acquired add to the competences acquired during studies, we can assume a positive effect on employability and thus on salary, while search duration should be decreased (Harvey, 2001). In that same line, the number of internships can be assumed to reduce search duration and increase salary. Besides internships and vocational training prior to studies, a farming family background also should contribute to the practical experiences of graduates. These variables are therefore introduced into the analysis, hypothesizing that ceteris paribus,

H3: Practical experience (a) reduces search duration and (b) positively affects entry salary.

1.3.4 International experiences

The agribusiness sector worldwide is increasingly characterised by multinational companies (Azar, 2012; Cai, 2013), and Heyder, Makus, and Theuvsen (2011) provide evidence for a positive performance impact of internationalization in European agribusiness cooperatives. Agribusiness firms therefore can be expected to increasingly demand international experience and skills, which can be expressed through internships abroad as well as number of languages spoken. This leads to the hypothesis

H4: International experience and number of languages spoken (a) reduce search duration and (b) positively affect entry salary.

1.4 Dimensions of search behaviour

Another important research stream links job search success to search behaviour. Search behaviour here is typically modelled as a function of behavioural variables as well as social and biographical context (compare Figure 1), which also can have a direct impact on characteristics of the employment process, such as status achieved, or search duration. Among the relevant variables, the time of starting the search clearly should affect the time between graduation and job entry:

H5: The earlier a graduate candidate starts searching for a job, the shorter will be the duration of search, or unemployment, respectively, after graduation.

1.5 Determinants of search behaviour and job search success

1.5.1 Social capital

Based on Granovetters' seminal study on the impact of networks on job search success, (Granovetter, 1973), it can be assumed that a larger network increases the probability of being informed about a vacancy which fits the own profile. Zhang, Liu, Loi, Lau, and Ngo (2010) showed for the case of Chinese employees the positive effect of networks on career achievement. Furthermore, there is a well-studied uncertainty-reducing effect of mutual acquaintances between employer and applicant (Uzzi, 1996), which should also lead to reduced search duration.

H6: Larger networks and common acquaintances a) reduce job search duration and b) lead to higher entry salaries.

1.5.2 Mobility

Practitioners often claim that specifically students of agricultural sciences are hardly mobile and seek jobs close to their families. Such a regional limitation of the job search can be expected to increase search duration, given a smaller job market, but also lower salaries, since graduates make trade-offs between social embeddedness and economic achievement, i.e., salaries (Yankow, 2003).

H7: Graduates who are more flexible with respect to their location, will face a) shorter search durations and b) higher salaries.

1.5.3 Competition and salary expectations

Further straightforward determinants of search duration and salaries are the degree of competition for an envisaged job, and the personal salary expectations. It can be assumed, that

H8: Graduates facing less competition will have shorter search durations, and receive higher salaries.

H9: Graduates who have lower salary expectations a) have shorter search durations and b) receive lower salaries.

1.5.4 Personality

Personality characteristics are among the most prominently analysed antecedents of job search success in the human resources management literature (Kanfer et al., 2001). Generally, it has to be stated that the evidence for most of the variables is quite mixed, depending on operationalization and sample characteristics. Spurk and Abele (2011), for example, found that extraversion, conscientiousness and self-efficacy had only indirect effects on salary, while neuroticism and agreeableness have direct negative impacts on salary and additional indirect impacts via career advancement goals. Based on their meta-analysis, Kanfer et al. (2001) conclude that extraversion, openness, and agreeableness have a negative impact on search duration, while neuroticism negatively influences status and number of offers. Perceived locus of control was not found to have a significant impact on the success dimensions, while optimism has ambivalent effects, with a positive impact both on status but also search duration, which may relate to the fact that more optimistic people do not put as much effort into the search process as people scoring lower on optimism. Further, optimistic people might not

feel the need to accept the first offer they get. Self-esteem and self-efficacy, on the other hand, positively affect number of offers and status, while leading to shorter search duration. Turban, Lee, Veiga, Haggard, and Wu (2013) use an approach-avoidance self-regulatory framework and find evidence for positive affect to influence motivational control and procrastination, which significantly affect number of interviews.

Besides the classical "Big five" personality dimensions, the "Core Self-Evaluation Scale" by Judge, Heller, and Mount (2002) is often used in the context of employee satisfaction and performance, but also has been applied in relation to job search behaviour (Wanberg, Zhang, & Diehn, 2010). This scale comprises 12 measures for self-esteem, self-efficacy, neuroticism, and external locus of control, which are combined into one uni-dimensional factor, where the latter two dimensions are reverse-scaled, so that a higher CSE score corresponds to more self-esteem, more perceived self-efficacy, less neuroticism, and internal locus of control. Judge (2009) also shows that personality has an impact on expected salary: when predicting salaries based on parents' occupation, individuals scoring high on the CSE scale predict an increasing income with increasing cognitive demands of the occupation, while individuals scoring low see no relationship between parents' occupation and income. These findings lead to the hypothesis

H10: Core-self evaluations are (a) negatively related to search duration and (b) positively related to entry salary.

1.5.5 Gender

Across all studies analysed in the meta-analysis by Kanfer et al. (2001), gender does not have a significant impact on employment outcomes. Spurk and Abele (2011) model an indirect gender effect via working hours and find a positive indirect impact of male gender. Other authors clearly reveal a gender-related wage gap (Fortin, 2008; Lips, 2013; Moore, 2006). It is therefore hypothesized that

H11: Female graduates c.p. (a) search longer for a job and (b) receive lower entry salaries.

1.6 Control variables: job characteristics

Several characteristics of the job have to be introduced as control variables when trying to predict new entrants' salaries: a first clear determinant of salary is working hours (Gaertner, 1999). For reasons of simplicity, this study distinguishes between full time and part time contracts only.

Booth, Francesconi, and Frank (2002) and Amuedo-Dorantes and Serrano-Padial (2007) find that *temporary contracts* are generally related to lower salaries, and therefore (among others) generally less desirable. It can thus be assumed that there is a negative impact on salary, and a positive relationship with job search duration, since less desirable jobs would be taken only if prospects of finding an unlimited employment worsen.

Additionally, the *sector of occupation* (upstream or downstream agribusiness, services in agribusiness, or outside agribusiness) will have an impact on the level of salary, with the upstream sectors (namely high-technology machinery, seed producers, or chemical firms) paying above average, and services sector probably paying below average levels. We also assume that graduates entering a job outside agribusiness would receive lower salaries, both as a consequence of mismatch (Robst, 2007) and of longer search.

Finally, given the recent turbulences in the world economy, it has to be assumed that the *year of graduation* acts as a control variable as well, with years of better economic performance and positive expectations leading to shorter search durations and probably also higher salaries. The development of economic recovery after the crisis would suggest 2011 to have been a better year for job search than the years during and shortly after the crisis (Ifo, 2014). Due to the above described changes to Master and Bachelor degrees in the recent decade, the year of graduation not only reflects a certain market situation. It can further be assumed that, e.g., the duration of internships not only varies across HEI type, but also changes over time and that furthermore, curricula and average study durations changed.

2 Material and Methods

2.1 Survey design and measures

A standardized online survey was conceived based on the above literature review. The questionnaire mainly collects biographical information.[1] For the biographical information, as well as for search behaviour, we relied on graduates' self-reports concerning year of enrolment and year of graduation, HEI type, number of internships, duration of internships, etc. To measure search behaviour we asked when the search for a job was started (before, right at graduation, or later). Job search duration was measured in months as the *time between graduation and entering the first position.* Entry salary could be rated on an 11-point scale starting at "up to 20.000€" and ending at "> 70.000€.

Additionally, data on attitudes, perceptions and personality traits of the participants were collected. Wherever possible, we employed established scales or indicators. With respect to determinants of job search success, students could rate how much they thought specific aspects had contributed to their being employed. Here, study performance (H2), practical skills (H3), international experience (H4), and networks (H6) had to be rated as potential reasons for employment on a 5-point scale, besides relative mobility (H7), competition for the job (H8), and salary expectations (H9). Inventories of skills and competencies relevant for employability were taken from a study carried out by Association of German Chambers of Commerce and Industry in other industrial fields (Heidenreich & DIHK, 2011). Personality was measured using the well-established Core Self Evaluation Scale (Judge et al., 2002). Principal component analyses were carried out to reduce the complexity of the measures of employment reasons and personality. Results are presented in the appendix.

2.2 Data collection and sample description

The survey link was distributed by universities and UAS to their graduates of the past five years. All except two universities with agricultural curricula in Germany took part in the study. The survey was online between

[1] Of course, the data quality here highly depends on the ability of participants to remember the various aspects of their job search.

December 2011 and first week of February 2012. For the specific analysis presented here, the sample comprises 305 graduates, which fulfil the following requirements:

- a Master of Sciences or "Diplom" degree from universities, or a Bachelor of Sciences or "Diplom" from UAS,[2]
- employed outside farming after graduation,[3]
- graduated between 2007 and 2011.

2.2.1 Sociodemographics and educational biography

The sample contains 59% women, and the average age of participants at the beginning of studies was 22.0 (median =21), with a standard deviation of 3.3 years. The average age at graduation, was 26.4 (26) years, with a standard deviation of 2.9 years.

64% of participants are university graduates and 36% UAS graduates. 23% studied in Eastern Germany, 18.4% in the North, 24.3% in the West, and 34.4% in the South. The degrees received are university "Diplom" (36.4%), university Master (27.3%), UAS "Diplom" (23.9%) and UAS Bachelor (12.5%). These degrees differ significantly with respect to study duration, with university degrees requiring longer study periods: as shows Table 1, graduates with an old university Diplom studied 6.5 years on average, while the university Master graduates took only 5.1 years on average. The difference of medians is a bit smaller, but with 1 year still considerable. The effect of the new degrees at the UAS seems to be stronger even, with UAS-Diplom graduates reporting 5.7 (Median =5.8) years on average, whereas UAS Bachelors reported only 4.2 (3.8) years of study. 16.7% of the participants graduated in 2007 and 2008, respectively, 27.5% in 2009, 20.3% in 2010 and 18.7% in 2011.

Table 1: Study duration conditional on degree

Degree	N	Median	Mean	Std. deviation
Uni-Diplom	111	6.8	6.5	.94
Uni-Master	83	5.8	5.1	1.73
UAS-Diplom	73	5.8	5.7	.90
UAS-Bachelor	38	3.8	4.2	.68
Overall	305	5.8	5.6	1.42

2.2.2 Search success

Search duration ranges between -12 and 60 months, with a median of 1 month, thus the distribution is positively skewed and takes negative values for 2% of the responses, indicating that some students make the transition to the job market even before graduating. The median category of entry salaries was between 25.000 and 30.000€, and only 4.3% of graduates earned more than 45.000€ in their first job. The scale was therefore reduced to seven levels, collapsing the highest categories into one with salaries of 45.000 € or more.

[2] Bachelors of Sciences graduated from universities generally continue their studies in a Master program, with only few exemptions. UAS introduced Master programs only recently. For these degrees, there are too few observations of graduates having made the transition to the job market yet.

[3] Graduates who haven't made the transition to the job market yet or who took a position in agriculture were excluded from the analysis.

2.2.3 Search behaviour

The majority (57.7%) of graduates claimed to have started searching a job already before graduation, while 26.9% started at graduation, and 9.5% started later. The rest was either hired on a firms' initiative, or already had a job before studying and continued this occupation. The number of interviews reported by graduates lies between 0 and 20, with mean 2.6 and Median 2.

2.2.4 Job characteristics

The jobs acquired were to the majority (85.6%) full time jobs, and about a half of respondents (47.9%) had temporary contracts in their first employment. About two thirds of respondents claim to have found a job in their preferred sector (66%), and their preferred occupation (63%), respectively. The specific sectors are the upstream sectors of agribusiness, where 23% found a job, while 17.4% started work in downstream sectors, 40.3% in services around agribusiness, and 7.5% answered "other sector in agribusiness". 11.8% left the agribusiness sector to work in another field, i.e., "outside agribusiness".

3 Results on determinants of job search success

The next subsection presents results with respect to the dependent variables. Given the skewed distribution of search duration and the ordinal scaling of entry salary categories, as well as the high number of dummy variables, nonparametric tests are employed for a first examination of hypotheses on search duration. We compare not only HEI types, but also test for gender effects within the HEI groups, since female respondents were overrepresented among university graduates in our sample. Given that prior research as well as our initial data examination indicates gender specific differences in determinants of job search success, we thereby control for potential biases of the HEI effect. An ordinal regression follows for the analysis of determinants of entry salaries.

3.1 Differences between graduates from universities and UAS in terms of job search success

As show the results of Median comparisons between university and UAS graduates (Table 2), there are differences between the two groups only with respect to search duration. Median search duration is at two weeks after graduation for UAS graduates and six weeks for University graduates in this sample. The upper quartile among UAS students however, is two months higher than that among University graduates.

Table 2: Median and distribution comparisons of search success by type of HEI

		Overall sample	**HEI**		**Female**		**Male**	
			University	**UAS**	**University**	**UAS**	**University**	**UAS**
Search duration	*Median*$^{H, h}$	1	**1.5**	**.5**	2	1	0	0
	Quartiles	(0; 4.5)	**(0.0; 3.0)**	**(0.0; 5.0)**	(0; 6)	(0; 7)	(0; 3)	(0; 1.25)
	N	305	194	111	127	53	67	58
Entry salary	*Median*$^{U, G}$	3	3	3	**3**	**3**	**4**	**4**
	Quartiles^{u,g}	(2; 5)	(2; 5)	(2; 5)	**(2; 4)**	**(2; 4)**	**(2; 6)**	**(3; 5.25)**
	N	305	194	111	127	53	67	58

Search duration measured in months after graduation
Categories of entry salary: 1= up to 20.000€; 2= 20-25.000€; 3= 25-30.000€; 4= 30-35.000€; 5= 35-40.000€; 6= 40-45.000€; 7= >45-50.000€
$^{H(h)}$ = significant Median (distribution) difference between HEI types

F (f) =significant Median (distribution) difference between HEI types within Females
M (m) = significant Median (distribution) difference between HEI types within Males
G (g) =significant Median (distribution) differences between genders within UAS
U (u) =significant Median (distribution) differences between genders within University

Entry salaries, on the other hand, differ significantly between genders within the HEI types. Male graduates in both HEI types receive significantly higher salaries, with a median difference of one category and the upper quartile being 1.25 (UAS) and 2 (university) categories higher than that of female respondents.

The examination of Spearman-Rho rank correlations between search duration and entry salary within the two groups of HEI graduates reveals further differences: while among university graduates, we find a highly significant negative correlation of -.249 between search duration and salary, the same relationship is weaker (-.181) and significant only at the 10% level among UAS graduates. In the following section, the relationship between search duration and its determinants is analysed using median comparisons and rank correlations.

3.2 Determinants of search duration

Table 3 presents the results of Spearman-Rho rank correlation analysis for the ordinally scaled determinants, in the order of the hypotheses.

Table 3: Spearman-Rho rank correlations between search duration and employability dimensions

	HEI		Female		Male	
	University (N=194)	**UAS (N=111)**	**University (N=125)**	**UAS (N=53)**	**University (N=67)**	**UAS (N=58)**
H2 ER-Index study performance	**-.169****	-.100	**-.196****	-.203	-.128	.014
H3 ER practical experience	**-.172****	-.110	**-.181****	-.107	-.104	-.019
H3 Number internships Germany	-.036	**.198****	-.087	**.361****	.038	-.024
H3 Duration internships Germany	-.054	**.254****	-.097	**.288****	.045	**.238***
H4 ER-Index international skills	**.123***	-.119	.043	-.210	**.307****	.049
H4 Number of languages	.089	.048	-.003	.172	**.193***	-.140
H6 ER-Index social capital	**-.200****	-.073	**-.329****	-.035	.093	-.066
H7 ER greater mobility	.032	-.100	.063	-.077	-.096	-.083
H8 ER no competitors	.057	.047	.062	.164	.027	-.119
H9 ER lower salary expectations	**.154****	.036	**.179****	.009	.050	.035
H10 Index self-esteem & self-efficacy	**-0.175****	**-.195****	**-.197****	**-.251***	-.054	-.158
H10 Index neuroticism & external LoC	**0.124***	**.175***	.117	.206	.068	.089

ER=Employment reason (single item); ER-Index=unweighted average of all items included in the respective factor
Correlation coefficient significant at *** 1%-level, ** 5%-level, * 10%-level

Study performance (H2), measured as the self-assessed reason for employment, shows to have a negative relationship with search duration among university graduates, with a small negative Spearman Rho rank correlation coefficient (-.169) which is significant at the 5% level. The analysis of gender-specific effects reveals a significant impact only for female university graduates (-.196). For male university graduates and UAS graduates, no significant impact is found.

The same holds for self-assessed practical experience (H3) and social capital (H6), which have the expected negative impact on search duration among female university graduates, and a smaller but highly significant effect in the full sample. On the other hand, number and duration of internships, as further indicators of

practical experience (H3), are significant only in the UAS models, both in the full and the female sample. For male UAS graduates, we find a correlation only with duration of internships. The coefficients, however, are positive, indicating that more and longer internships during studies result in longer search durations after graduation. International skills (H4) also have a counterintuitive significant positive impact (.123) on search duration in the full sample. This, however, could be attributed to the male university graduates, who exhibit the only significant coefficient (.307). In this subsample, the number of languages spoken (H4) also has a positive impact on search duration. These results contradict our hypothesis that employers increasingly seek graduates who are internationally oriented and able to communicate in different languages, whereas here, longer search durations occur for those males perceiving themselves as having superior international skills and speaking more languages.

The perception of being more mobile (H7) or having no competitors (H8) is not related to graduates' job search duration. Lower salary expectations (H9) are positively related to search duration in the overall sample of university graduates, but the separate analysis shows that the effect could be attributed to the females in this subsample. Probably, females have a stronger tendency to adjust their salary expectations with increasing search duration. Finally, the personality indicators (H10), self-esteem and self-efficacy as well as neuroticism and external locus of control are significantly related to search duration in the expected direction in the full sample. In the sub-samples, only self-esteem and self-efficacy are significant, and only in the female models.

For the dummy-coded determinants of search duration, median and distribution comparisons were carried out. In line with previous analyses, our interest is not only in the differences in medians between the categories of the determinants, but also in the differences between genders within the same HEI type as well as between HEIs conditional on gender. The strongest median differences in search duration are caused by the timing of job search start, which results in differences in job search duration from 1 (UAS male) and 5.5 (UAS female) months, respectively, between those who started to search before graduation, or later.

Table 4: Determinants of search duration conditional on HEI type and gender: graduate characteristics

		Overall sample	**Female**		**Male**	
			University	**UAS**	**University**	**UAS**
H3 Vocational training	*Median* *Quartiles* *N*	0** (0; 3)*** 83	1** (0; 2)** 20	.75 (0; 3.75) 22	0 (0; 2.6) 16	0 (0; 1) 25
No vocational training	*Median* *Quartiles*^{u,g} *N*	1** (0; 6)*** 222	3** **(0; 6)**** 107	3 **(0; 8)** 31	.5 **(0; 4)** 51	.5 **(0; 3)** 33
H3 Farm child	*Median* *Quartiles*^{g} *N*	0 (0; 3)** 102	1 (0; 5) 29	1 **(0; 5)** 17	0 (0; 3) 28	0 **(0; 1)***** 28
Not Farm child	*Median* *Quartiles*^{u} *N*	1.5 (0; 5)** 203	2 **(0; 6)** 98	2 (0; 7.75) 36	1 **(0; 3)** 39	1 (1; 3.25)***** 30
H4 Internships abroad	*Median* *Quartile*^{u} *N*	1 (0; 4) 95	2 **(0; 6)** 36	0 (0; 8) 13	0 **(0; 3)** 26	0 (0; 2.5) 20
No internships	*Median*^{G} *Quartiles*^{g}	1 (0; 5)	2 (0; 6)	**1.5** **(0; 6.75)**	0.5 (0; 4)	**.25** **(0; 1.25)**

abroad	*N*	210	91	40	41	38
H5 Start search before graduation	*Median* *Quartiles* *N*	0*** (0; 2)*** 176	1*** (0; 4) *** 65	0*** (0; 2.5)*** 29	0*** (0; 1.25)*** 42	0* (0; 1)*** 40
Start search later	*Median* *Quartiles* *N*	3*** (1; 7)*** 129	4*** (1; 8.25)*** 62	5.5*** (1.5;8.75) *** 24	3*** (0; 4.5)*** 25	1* (0; 4.25)*** 18

* significant difference between categories of determinants at 10%-level; **5 %level; *** 1%-level

F (f) =significant Median (distribution) difference between HEI types within females

M (m) = significant Median (distribution) difference between HEI types within males

G (g) =significant Median (distribution) differences between genders within UAS

U (u) =significant Median (distribution) differences between genders within university

Dummy coded indicators for practical experience (H3) are vocational training prior to studies, and a farming background. Vocational training indeed leads to shorter search durations in the overall sample and among female university graduates, whereas being a farm child reduces search duration in the overall sample, but in the subsamples this effect can only be found among male UAS graduates (Table 4). Internships abroad (H4) do not make a difference with respect to search duration, but we find differences between the genders within HEI types: UAS males without internships abroad show significantly shorter search durations, in line with the positive impact of international skills reported for this group in Table 3.

Table 5: Determinants of search duration conditional on HEI and gender: job characteristics

			Female		**Male**	
		Overall sample	**University**	**UAS**	**University**	**UAS**
Temporary contract	*Median* *Quartiles* *N*	1 (0; 5.25) 146	2 (0; 6) 76	3 (0; 7.25) 18	1 (0; 3.75) 40	1 (0; 1) 12
Unlimited contract	*Median* ^{F,U} *Quartiles* ^{f,g,u} *N*	.5 (0; 4.5) 159	**2** **(0; 5)** 51	**.5** **(0; 7)** 35	**0** **(0; 3)** 27	0 **(0; 2.25)** 46
Full time employment	*Median* ^{U} *Quartiles* ^{g,u} *N*	1 (0; 4)** 261	**2** **(0; 6)** 102	1 **(0; 6)** 50	**0** **(0; 3)** 52	0 **(0; 1.5)** 57
Part time employment	*Median* *Quartiles* *N*	1.25 (0; 7.5)** 40	1 (0; 6) 25	N=3	1 (0; 6) 15	(N=1)
Upstream sector	*Median* ^{G,U} *Quartiles* ^{g,u} *N*	1* (0; 3) 71	**1.5** **(0; 4)*** 22	5.5 (1.5; 11.25) 6	**0** **(0; 1.25)** 22	0* (0; 1) 21
Down-stream sector	*Median* *Quartiles* ^{u} *N*	2* (0; 5.5) 53	3 **(0; 6)*** 27	0 (0; 7.5) 13	0 **(-1; 1.5)** 5	1.5* (0; 4.5) 8
Services in agri-business	*Median* *Quartiles* *N*	.5* (0; 5) 123	1 (0; 5.25)* 50	.5 (0; 6) 23	.5 (0; 3.25) 34	0* (0; 2.5) 16
Outside agri-business	*Median* *Quartiles* ^{f} *N*	3.5* (1.5; 6.75) 36	5 (2; 8)* 21	3 (0; 3) 7	N=2	1* (1; 5.25) 6
Preferred sector	*Median* *Quartiles* ^{u} *N*	.5 (0; 4)** 202	1* **(0; 6)*** 87	0 (0: 7.25) 26	0 **(0; 3)** 52	0 (0; 1) 37

Not pref. sector	*Median*	2,5	4*	3	1	1
	Quartiles [g]	(0; 5.25)**	(1.5; 6)*	**(0; 7)**	(0; 6)	**(0; 3)**
	N	98	35	27	15	21
Preferred job	*Median*	.5	1***	0	0	0
	Quartiles [u]	(0; 3)	**(0; 5)**	(0; 6)***	**(0; 3)**	(0; 3)
	N	192	76	26	49	41
Not pref. job	*Median* [G]	3	4***	**3**	1.75	**0**
	Quartiles [g]	(0; 7.25)	(1.13; 8)	**(0; 10)*** **	(0, 8)	**(0; 1)**
	N	102	44	25	16	17

* significant difference between categories of determinants at 10%-level **5 %level *** 1%-level

F (f) =significant Median (distribution) difference between HEI types within Females

M (m) = significant Median (distribution) difference between HEI types within Males

G (g) =significant Median (distribution) differences between genders within UAS

U (u) =significant Median (distribution) differences between genders within University

Table 5 reports the results on the relevance of job characteristics. Significant differences in job search duration can be identified in the overall sample with respect to full v. part time employment, where full time employment is associated with shorter search durations. Some peculiarities can be found with respect to gender- and HEI specific analyses: among university graduates, male graduates had shorter search durations for reaching a full time position, than the female university graduates. Within the female sample, female UAS graduates who got an unlimited contract in their first position searched significantly shorter than female university graduates.

There are also significant differences conditional on the sector: new entrants in the services sector indicated a median search duration of two weeks, followed by the upstream (1 month) and downstream sector (2). Those who found a job outside agribusiness have a median search duration of 3.5 months. This corresponds with shorter search durations among those who entered a job in their preferred sector (median = 2 weeks) as compared to those who did not (3 months).

3.3 Ordinal regression to explain entry salary

Given the differences found between University and UAS graduates, the ordinal regression to explain entry salaries is carried out separately for the two groups of participants. Due to the high number of explanatory variables, a further division into gender sub-samples seems not appropriate. There are some important differences in the separate models for university and UAS graduates, respectively. Table 6 shows the results for the whole sample as well as the subsamples. For a better overview, determinants are sorted according to the order of the respective hypotheses. As indicate the high significance values for the test of parallel lines at the bottom of Table 6, the ordinal regression model is appropriate in all three cases. The explanatory power of the models is satisfactorily. It is worth noting, however, that despite the fewer significant variables (printed bold and grey-shaded) in the UAS model the Pseudo-R^2 measures are a bit higher for that model.

Only four variables can be identified which have a significant impact both in the overall and in the two subsamples (printed bold in the left column of Table 6). These are: practical experiences as assumed employment reason, the number of languages spoken, gender, and the control variable “unlimited contract”.

Study performance (H2) has no significant impact in neither of the models. Among the indicators of practical experience (H3), only the self-assumed employment reason has a significant positive impact on salary in all subsamples. “Farm child” is an additional positive explanatory variable only in the group of UAS graduates.

Also for international skills (H4) only the self-assessed employment reasons in the overall samples and among UAS graduates are significant. The impact is positive as expected. Number of languages (H4), however, has a negative impact on salaries across all models. We discussed this counterintuitive finding already for search duration. Internships abroad, as a further potential indicator of international experience, does not have an impact on salaries in neither of the models.

Table 6: Results of ordinal regressions to explain entry salaries

	Overall (N=304)						University (N=126)						UAS (N=111)					
	Coeff.	Std. Error	Wald	Sig.	95 % conf.		Coeff.	Std. Error	Wald	Sig.	95 % conf.		Coeff.	Std. Error	Wald	Sig.	95 % conf.	
					Lower	Upper					Lower	Upper					Lower	Upper
Entry Salary up to 20.000€	1.263	1.893	.445	.505	-2.448	4.973	4.079	2.530	2.600	.107	-.879	9.038	-1.234	3.336	.137	.711	-7.773	5.305
Entry Salary 20-25.000€	2.459	1.895	1.684	.194	-1.255	6.173	**5.309**	2.535	4.386	**.036**	.341	10.278	.167	3.336	.002	.960	-6.372	6.705
Entry Salary 25-30.000€	**3.624**	1.900	3.636	**.057**	-.101	7.348	**6.400**	2.547	6.316	**.012**	1.409	11.391	1.754	3.342	.275	.600	-4.797	8.305
Entry Salary 30-35.000€	**4.895**	1.908	6.581	**.010**	1.155	8.634	**7.735**	2.565	9.093	**.003**	2.708	12.763	3.279	3.351	.957	.328	-3.289	9.847
Entry Salary 35-40.000€	**6.088**	1.918	10.074	**.002**	2.329	9.848	**8.864**	2.584	11.769	**.001**	3.800	13.928	4.983	3.363	2.196	.138	-1.608	11.574
Entry Salary 40-45.000€	**7.565**	1.940	15.200	**.000**	3.762	11.369	**10.494**	2.621	16.026	**.000**	5.356	15.631	**6.492**	3.390	3.668	**.055**	-.152	13.136
H1 UAS	**.781**	.261	8.949	**.003**	.269	1.293												
H2 ER-Index study performance	.078	.145	.289	.591	-.207	.363	.110	.198	.312	.576	-.277	.498	-.208	.248	.701	.403	-.695	.279
H3 ER Practical experience	**.172**	.096	3.203	**.074**	-.016	.361	**.238**	.135	3.096	**.078**	-.027	.503	**.263**	.155	2.876	**.090**	-.041	.566
H3 Number of internships in GER	.045	.087	.269	.604	-.126	.216	.041	.108	.146	.702	-.171	.253	.032	.167	.037	.848	-.294	.358
H3 No vocational training	-.269	.265	1.030	.310	-.788	.250	-.262	.382	.470	.493	-1.010	.486	-.367	.433	.717	.397	-1.215	.482
H3 *No* farm child	-.247	.237	1.092	.296	-.711	.217	.166	.318	.273	.601	-.457	.789	**-.833**	.413	4.071	**.044**	-1.642	-.024
H4 ER-Index international skills	**.260**	.106	6.048	**.014**	.053	.467	.011	.126	.008	.931	-.236	.258	**1.072**	.230	21.675	**.000**	.621	1.523
H4 Number of languages	**-.502**	.154	10.567	**.001**	-.804	-.199	**-.562**	.192	8.549	**.003**	-.938	-.185	**-.493**	.301	2.684	**.101**	-1.082	.097
H4 No internships abroad	-.249	.259	.921	.337	-.757	.260	-.331	.328	1.020	.312	-.974	.312	.084	.523	.026	.873	-.941	1.109
H5 Start search later	**.650**	.238	7.445	**.006**	.183	1.117	**.967**	.304	10.119	**.001**	.371	1.563	.177	.465	.145	.703	-.734	1.089
H6 ER-Index network ties	**.172**	.104	2.751	**.097**	-.031	.375	.189	.139	1.856	.173	-.083	.461	.083	.177	.218	.641	-.265	.430
H7 ER greater mobility	.075	.078	.934	.334	-.077	.228	.043	.106	.161	.688	-.165	.250	.073	.138	.278	.598	-.197	.342
H8 ER no competitors	-.109	.090	1.458	.227	-.286	.068	.059	.122	.234	.629	-.180	.297	**-.395**	.178	4.901	**.027**	-.744	-.045
H9 ER lower salary expectations	**-.256**	.105	5.900	**.015**	-.462	-.049	**-.269**	.139	3.722	**.054**	-.542	.004	-.177	.188	.894	.344	-.545	.190
H10 Self-esteem & self-efficacy Index	.258	.248	1.082	.298	-.228	.743	**.914**	.336	7.384	**.007**	.255	1.574	-.524	.422	1.540	.215	-1.351	.304
H10 Neuroticism & externalLoC Index	.181	.147	1.509	.219	-.108	.470	**.394**	.192	4.206	**.040**	.017	.770	-.129	.259	.248	.619	-.638	.379
H11 Gender Male	**.768**	.242	10.111	**.001**	.295	1.242	**.746**	.313	5.669	**.017**	.132	1.361	**.797**	.429	3.444	**.063**	-.045	1.638
Part time employment	**-2.969**	.408	52.845	**.000**	-3.769	-2.168	**-3.068**	.465	43.547	**.000**	-3.980	-2.157	-2.177	1.672	1.695	.193	-5.455	1.100
Unlimited contract	**1.149**	.242	22.501	**.000**	.674	1.624	**1.014**	.305	11.045	**.001**	.416	1.612	**1.488**	.456	10.642	**.001**	.594	2.383
Not outside agribusiness	**.768**	.366	4.398	**.036**	.050	1.486	**1.228**	.499	6.062	**.014**	.250	2.206	.635	.635	.999	.318	-.610	1.880
Not preferred sector	-.017	.266	.004	.948	-.538	.503	.385	.360	1.146	.284	-.320	1.091	-.276	.436	.399	.527	-1.131	.580
Not preferred job	-.220	.256	.742	.389	-.722	.281	-.366	.330	1.234	.267	-1.012	.280	-.328	.483	.461	.497	-1.275	.619
Graduation 2011 vs. 2007	.139	.373	.139	.709	-.593	.871	.013	.494	.001	.980	-.955	.980	**1.158**	.700	2.734	**.098**	-.215	2.531
Graduation 2011 vs. 2008	-.054	.366	.022	.882	-.771	.663	-.328	.454	.522	.470	-1.219	.562	.558	.685	.664	.415	-.784	1.901
Graduation 2011 vs. 2009	.127	.323	.154	.695	-.507	.760	.153	.408	.141	.707	-.646	.953	.689	.624	1.221	.269	-.533	1.912
Graduation 2011 vs. 2010	.048	.348	.019	.891	-.635	.730	.067	.443	.023	.880	-.801	.934	.469	.657	.510	.475	-.819	1.757
Cox & Snell's Pseudo R^2	.453						.490						.581					
Nagelkerke's Pseudo R^2	.465						.502						.596					
McFadden's Pseudo R^2	.162						.181						.235					
Test of parallel lines	Sig.=.678						Sig.=.332						Sig.=.782					

Interestingly, those who started searching for a job later (H5) also indicated higher entry salaries. Social capital as an employment reason (H6) has a positive impact on salaries only in the full sample. The personality indicators (H10) are relevant only in the university model. However, both coefficients are positive, meaning that a higher degree of neuroticism and external locus of control would also be associated with higher salary categories, which contradicts the current state of knowledge. It is unclear so far whether the effect is mediated by another variable.

As expected, male graduates have a higher likelihood of receiving higher entry salaries than women in all models. For the control variables, the significant variables in the overall sample and the university model are the same: Part time jobs only have a negative impact on salaries, unlimited contracts and jobs within agribusiness have a positive impact on salaries. The non-significance of part-time contracts in the case of the UAS model is likely due to the small share of part-time employees in this sub sample, which is only 3.6%, as compare to 20% among university graduates.

4 Discussion of practical and scientific implications

The study revealed differential determinants of job search success among graduates from universities and UAS, respectively. However, it also showed that a distinction between genders is crucial, since some of the differences between the HEI types are likely due to differing shares of female participants in the respective HEI subsamples. Further, the heterogeneity of search success is stronger among university graduates in our sample. This might reflect the heterogeneity of study programs, which is greater in universities than in UAS.

Indicators of practical skills, such as internships, did not consistently reveal the expected positive effects on job search success. To the contrary, among UAS graduates, internships and international skills even are associated with longer search durations. Nevertheless, the ordinal regression also revealed a positive impact of both practical and international experience on salaries, where these were measured as the self-assumed employment reasons. International skills, and being a farm child, obviously only matter for salaries among UAS graduates. We suggest that international experience can be a strongly distinguishing characteristic in this group, while among university graduates, international experience is much more common today. Being a farm child, on the other hand, as an indicator of practical skills, was expected to be more relevant among UAS graduates who, with a more applied focus of studies, also seek more applied jobs.

The number of languages spoken, has a negative impact on search success in all models. Unobserved variables, such as a migration background, or specific trade-offs between job-related international opportunities and salaries could play a role in this counterintuitive finding and should be taken into account in following studies.

An expected result is that while women find a job as fast or slow as their male fellow graduates, they still earn less. Possible explanations may reside in the differences in core self-evaluations that can be found between the genders: women on average show slightly higher levels of neuroticism and external locus of control and lower levels of self-esteem than men in this sample. Neuroticism in the bivariate analysis was found to negatively correlate with salary expectations, and positively with a later start of the job search, and with jobs outside

agribusiness. Such differentiation will be important also in future studies to better understand the reasons for gender differences, which are found by some, but not all studies (Kanfer et al., 2001). Arguing with Cai (2013), that employer beliefs play a crucial role in defining selection criteria, future research might, e.g., focus on both national and sector-specific cultural as well as isomorphic effects (Iles, Preece, & Chuai, 2010).

In terms of measurement, our results with respect to practical and international experience hint at the value of including the self-assessment of relevant skills. Despite the potentially more objective biographical measures, such as number and duration of internships, these data might be biased indicators of actual experience for several reasons. First, the information provided by the participants could be subject to memory lapses. Respondents might also be reluctant to exactly recall facts, leading to biased data provision. Second, information about internships here were restricted to number and duration of internships, as well as sectors worked in. The quality of the internships and the possibilities of gaining practical experience, however, cannot be captured by these measures. A combination of biographical information as well as self-assessments thus seems useful.

5 Conclusion

This paper set out to understand the determinants of job search success among students of agricultural sciences in Germany. A specific interest was in determining the effects of practical experience on search duration and salaries. The results however, are ambiguous in this respect. The classical method of acquiring practical experiences through internships does not have a clear effect on job search success, i.e., more is not always better. Among UAS graduates, number and duration of internships even were positively associated with search duration, but no effect on salaries could be found in either subsample. This should be taken as a clear appeal to students to thoughtfully decide which internships to pursue and where.

Besides practical experiences gained in extra-curricular activities such as internships, HEIs are usually taken as responsible to provide a training which directly qualifies for a career. However, in line with (Harvey, 2001), we argue that the educational institutions can only deliver one piece of the puzzle, which students have to integrate into their personal approach to achieve employability. Since the study of agricultural sciences in Germany is broad and aimed at a variety of job profiles, a training dedicated to specific profiles cannot be provided.

For Germany, the results fuel the debate about the dual approach of universities and UAS, which is more and more challenged. In terms of employability, at least, the results of this study do not show a clear advantage of one system over the other – and it thus clearly rejects the commonly accepted hypothesis that university graduates achieve higher salaries than UAS graduates. The question whether this is due to recent approximations of the two systems, or to a labour market which increasingly faces a lack of skilled employees, cannot be answered with this survey.

Generally, recent changes in the German higher education policy caused some challenges to this survey: The introduction of the Bachelor and Master degrees in both HEI types in the past decade leads to considerable heterogeneity with respect to the actual study programs which the participants were subject to, not only

across, but also within the same university or UAS. This study may thus be subject to some biases. The study should therefore be carried out in regular intervals. Nevertheless, the continuous incremental changes in study programs and an increased differentiation of degrees, as well as variation in the economic situation over time will always be a challenge to modelling the determinants of job search success among graduates in the field of agricultural sciences. Against this background, the achieved Pseudo-R^2 values for the ordinal regressions to explain entry salaries can be judged positively.

Potential avenues for future research could reside in country-specific and also sector-specific cultural differences both in terms of employer expectations, and graduate employability. This could lead to an international comparison of performance among educational systems against the backdrop of industry demand.

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Appendix

Table A-1: Results of the Principal Component Analysis for employment reasons

	Component				
	1	**2**	**3**	**4**	**5**
ER-Index Study Performance (CA=.62)					
Good grades	**.791**	.026	.032	-.137	.004
Combination of courses	**.758**	-.086	.165	.074	-.084
Knowledge	**.573**	.069	.066	.141	-.310
Duration of studies	**.503**	.404	-.105	.263	.168
CA = .49 - rejected					
Higher mobility than others	-.074	**.693**	.192	-.037	.006
Age	.179	**.650**	.038	-.080	.341
Sympathy	-.037	**.510**	-.007	.053	-.261
Societal Engagement	.132	**.481**	.004	.435	-.041
International Skills (CA=.78)					
Language skills	.162	.073	**.885**	.053	-.023
International experience	.032	.105	**.870**	.123	-.089
Network Ties (C=.55)					
Common acquaintances as reference	.047	-.234	.152	**.787**	.173
Large network	.010	.189	.057	**.773**	-.161
CA=.35 - rejected					
Lower salary expectations than others	.006	.135	-.049	-.011	**.646**
No competitors	-.185	-.021	.035	.128	**.637**
Practical experiences	.056	.312	.182	.236	**-.569**

Table A-2: Results of the Principal Component Analysis of the CSE Scale

	Component	
	1	**2**
Neuroticism & External Locus of Control (CA=.82)		
Sometimes I feel depressed.	**.787**	-.113
Sometimes when I fail I feel worthless.	**.783**	-.183
Sometimes, I do not feel in control of my work.	**.750**	-.035
There are times when things look pretty bleak and hopeless to me.	**.737**	-.308
I am filled with doubts about my competence.	**.594**	-.372
Self-Esteem & Self-Efficacy (CA=.74)		
When I try, I generally succeed.	-.039	**.789**
I complete tasks successfully.	-.035	**.735**
I am confident I get the success I deserve in life.	-.288	**.650**
Overall, I am satisfied with myself.	-.439	**.592**
I am capable of coping with most of my problems.	-.235	**.529**

N=305; Missing values replaced by means (0-4 cases/item)
Excluded items:
I do not feel in control of my success in my career.
I determine what will happen in my life.