Tertiary Education and Management (2021) 27:143–159
https://doi.org/10.1007/s11233-021-09070-8

ORIGINAL PAPER

Positional competition in a binary system: the case of Finnish higher education

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Received: 14 May 2020 / Accepted: 19 May 2021 / Published online: 11 June 2021

Abstract
Positional competition in the labour market entails graduate opportunities that depend not only on graduates' skills, experience and abilities, but also on how their educational credentials compare to those of others. In this study, we examined the positional competition in the Finnish labour market and compared the influence of different 'degree types' on the probability of obtaining high-paid, high-status jobs. We used a register-based 5% sample of 25–45-year-old Finnish higher education (HE) graduates from 2010 to 2012 (N = 63 486). It was expected that the relative position of graduates would be affected by the degree level as well as the educational field and the binary division (university vs. non-university) of HE. Therefore, master's and bachelor's degree levels in all educational fields from universities versus universities of applied sciences (UASs) were included. The method of analysis was logistic regression. According to our results, the binary divide structured the opportunities to enter high-paid, high-status jobs within different fields of education. The university master's degree graduates had the highest probability of succeeding in the Finnish labour market, and their status/rank elevated them above the competition by regulating access to certain professions or occupations through specific qualification requirements (i.e., credential social closure). Moreover, our results demonstrated how the degree rankings and the relative distance between university and UAS degrees vary in different fields. The Finnish case offers a valuable point of comparison to other HE systems with a binary structure.

Keywords Positionality · Job competition model · Social closure · Labour market success · Graduate employability · Binary system of higher education

Introduction

The European systems of higher education (HE) have expanded in size and scope in recent decades. A number of countries now operate with a binary structure, where graduates are qualified to apply for job opportunities in the same fields along distinct sectoral pathways

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(OECD, 2019). The purpose of this study is to investigate how this binary structure of HE influences positional competition among graduates in the job market.[1]

Our analytical perspective is based on Thurow's (1975) job competition model, which is often called the 'queuing model' because it views the labour market as consisting of two queues: a labour queue of job seekers and a corresponding queue of job opportunities. According to the theory, the value of education is relative, not absolute. An individual's position in the labour queue is determined by how his or her educational credentials compare to those of others (Thurow, 1975). Thus, opportunities for graduates competing in the labour market depend not only on their own qualifications, but also on the types of degrees that other graduates possess.

Most researchers studying graduates' positionality have only taken educational levels into account (e.g., Triventi et al., 2016; van de Werfhorst & Andersen, 2005; Wolbers et al., 2001). The few exceptions have concentrated on the specificity of different educational fields (Leppänen, 2019; Ortiz & Rodriguez-Menés, 2016). We argue that the relative position of individual degree holders in the labour queue is affected not only by educational level, but also by the field and the binary division of HE. As Di Stasio et al. (2016) recommended, we take into account both the university and the non-university HE sectors. Master's and bachelor's degree levels in all educational fields from Finnish universities versus universities of applied sciences (UASs) are included in our investigation.

Based on nationally representative register-based data (N = 63 486), we compare degree holders' prospects of being employed in the upper echelons of the Finnish labour market (by examining employment status, occupational levels and salaries). Our empirical results reveal the relative rank of different degree types within different fields of education in Finland. These findings contribute to a better understanding of the social and institutional context of graduates from different levels and sectors entering the labour market. The Finnish case offers a valuable point of comparison to other HE systems with a binary structure.

In terms of the organisation of this article, we begin by clarifying the job competition model and its relation to other theories that explain the relationship between HE and labour market competition. Second, we discuss the Finnish HE system in relation to the international context. Third, we explain the research questions, hypotheses and methods. After that, we present our empirical findings. Finally, we elaborate on these findings and discuss their significance for binary systems of HE.

Competition in the labour market

Some of the central theories attempting to explain the relationship between education and employment are the human capital theory (e.g., Becker, 1962), the job competition theory (Thurow, 1975) and the social closure theory (Weber, 1978). From the viewpoint of the human capital theory, a higher level of education equals greater human capital, which, in turn, equals higher productivity, leading to more and better employment opportunities at the individual level (e.g., OECD, 2018, 102–103).

[1] This study is part of the larger research project "Higher education graduates' employability and social positioning in the labour market" *(*HighEmploy*, 2018–2022).* The objective of the project is to explore graduates' employability as a relational and socially mediated process, taking into account the positional competition inherent in the labour market. For the project, we have conducted more than 70 graduate interviews in addition to statistical analysis.

In contrast, from the viewpoint of job competition theory, the value of education is not absolute but relative to the general educational level in society. Educational degrees are viewed as 'queuing tickets' and their value depends on what kind of education other job seekers have (Thurow, 1975, 75–97). The same kind of degree may occupy a different position in the labour queue at different times or in different countries. Thus, the job competition model recognises that achieving an HE degree may only mean keeping up with the competition between job seekers, not getting ahead of it.

The human capital theory and the job competition theory differ in terms of the perceived influence of the expansion of education on the occupational structure. According to the human capital theory, the expansion of HE is likely to create new jobs; the number of employment opportunities is expected to grow along with the supply of highly skilled workforce. In the job competition model, labour market positions are expected to form a more static pyramid-type structure, with the best (i.e., highest paid, highest status and most rewarding) positions being the scarcest and subject to positional competition (Hirsch, 1977, 41–51). Accordingly, the availability of high-level managerial and expert positions typically sought by HE graduates does not automatically increase with the expansion of education.

What the human capital theory and the job competition theory share is an assumption that employers attempt to choose the best employees available to them. From the viewpoint of both theories, during recruitment, employers have no direct information about a job seeker's ability to work. Instead, formal education is used as a proxy of a job seeker's quality, which is called productivity in the human capital model. In the job competition model, productivity is considered to be integral to jobs, not employees (Thurow, 1975, 85). Further, it is assumed in the job competition theory that training takes place on the job; employees do not enter jobs with fit for purpose skills. Rather, job seekers differ in terms of their 'trainability' or 'training costs', referring to how much the employer will need to invest in on-the-job training. As the presumed training costs of job seekers are, in turn, expected to vary based on education, the conclusions of the human capital and job competition models are somewhat similar; HE is expected to be beneficial to the job seeker.

Another important theoretical viewpoint is 'credential social closure', which involves restricting access to professions and occupations on the basis of educational requirements (Weber, 1978).[2] Whereas the job competition theory states that achieving an HE degree allows one to keep up with the competition between job seekers, the social closure theory explains how groups with particular status, such as established professions and occupations, gain privileged access to employment opportunities. Job seekers cannot be considered for employment in certain professions or occupations if they do not meet specific educational requirements (c.f., van de Werfhorst, 2011). By tightening the credentialing demands, occupational groups are able to exclude from the job competition all candidates who do not hold the right type of degree.

Weeden (2002) distinguishes three levels of credential social closure that professional and occupational groups typically use. The first level consists of specific degree requirements. The type of formal education required to meet job requirements is defined in the parliamentary process leading to legislation. For example, in Finland, the teaching

[2] While the term is applied specifically to education here, social closure originates from Weber (1978), referring generally to the regulation of social relationships (i.e., group memberships) and the exclusion of 'outsiders' from them. Social closure (op. cit., 43–46) exists because regulating access to groups offers advantages for 'insiders', who have a mutual interest in regulating membership in the group.

profession requires a specific master's degree-level education. On the second level, licensing by the state is required in addition to a specific educational programme, such as in the case of medical and social welfare professionals. The third level of social closure involves obligatory union membership. For instance, in Finland, only members of the Finnish Bar Association are allowed to use the professional title of attorney-at-law. Membership in the bar association is, in turn, tied to the formal educational requirements defined in legislation, which include attaining a university master's degree in law and passing the bar exam.

Thurow (1975, 76) stated that the applicability of the job competition model varies between countries and over time. However, this model assumes that, at any point in time, more education is always better in the eyes of employers. Based on Di Stasio (2017), this applies only if the educational degree matches the occupational field. Furthermore, in countries with a strong vocational orientation (i.e., a strong emphasis on occupationally specific education and occupationally tracked degrees), horizontally mismatched surplus education may even be penalised by employers.

In more generalist-oriented countries, such as the United Kingdom and the United States, the applicability of the job competition model can be expected to be higher than in vocationally oriented countries, including Germany, the Netherlands, Austria and Switzerland (van de Werfhorst, 2011, 543). According to Bol and van de Werfhorst's (2013, 294) international comparison using several indicators, Finland is situated roughly in the middle of the vocational–generalist scale. In addition, Finland has a sizeable public sector (roughly 25% of the employed workforce) in which formal qualification demands are strictly enforced. Thus, in this study, we acknowledge that occupationally specific degree requirements, which are particularly emphasised in traditional professions and in employment in the Finnish public sector, regulate the labour market queue of highly educated job seekers. Accordingly, we apply a combination of the job competition and the credential social closure theory.

The Finnish higher education system in the international context

The Finnish university sector underwent its first wave of expansion from the 1960s to the 1980s. During this period, equity was strongly emphasised in Finnish education policy and social policy. The objective of Finnish HE policy at the time was, above all, to ensure the uniformity of substance and quality among universities (Isopahkala-Bouret, 2018). Finnish universities mainly provided master's degree programmes, with bachelor's degrees being virtually non-existent. In the 1970s, HE reform abolished the bachelor's degree, which had served as an interim degree. In the 1990s, the possibility of offering bachelor's degree programmes was restored (Lampinen, 2003). The status of the university bachelor's degree remains unclear, despite the fact that it has not officially been an interim level degree since 2005, when the Bologna process was completed. Admission to university is still granted straight to a master's degree programme, and most university bachelor's degree graduates go on to complete a master's degree. It is noteworthy that traditional professions such as medicine and law require university master's degrees.

Overall, the number of HE graduates in Finland more than quadrupled from 1970 to 2017 (Nori et al., 2020). While the expansion seems steep, it hides considerable change in the Finnish HE system. Two major HE reforms took place at the beginning of the millennium. First, a binary structure of HE was established by creating the UAS system. Second, the Bologna process (which aimed to harmonise European HE

systems) led to the creation of a two-tiered degree structure throughout both HE sectors. Consequently, the current Finnish HE system is a binary model consisting of an academic sector (14 universities) and a vocationally oriented higher education sector (24 UASs). Bachelor's and master's level programmes across the two sectors are formally equivalent.

Finland's UAS system began as a limited experiment in 1991 and was fully operational by 2000, when the remaining UAS institutions were regularised (Ojala, 2017). The UASs were based on the former lowest tertiary level vocational institutions and were built by combining these existing institutions, which were educationally classified between the secondary and university level (Lampinen, 2003, 35). Originally, the UASs only offered basic degrees equivalent to the university bachelor's degree level. Today, UAS degrees are still predominantly bachelor's level degrees, despite UAS master's degree programmes having been officially introduced in 2005. UAS master's degrees are strongly connected to working life and linked to developmental challenges faced in the student's workplace (Ojala, 2017).

In Finland, the national regulations on student admission are uniform and applications for universities and UASs are pooled. Admission to all institutions is based on *numerus clausus*; that is, a limited number of student places. This makes the Finnish system one of the most competitive HE systems in the world, as more than 70% of the annual applicants do not gain admittance (Isopahkala-Bouret, 2019). A recent study on social equality in Finnish student admissions suggests that high selectivity produces substantially different distributions of student populations in different fields of education and in different HE sectors (Nori et al., 2021). Accordingly, the social background of university students is higher than that of UAS students. At universities, medicine in particular, but also dentistry and law, stand out clearly from all other fields. At UASs, the cultural field is the only high-status field in which students come from a high social background (Nori et al., 2021). The status ranking of different fields has remained relatively stable over a 30-year period. In the university sector, the differences between fields are more pronounced than in the UAS sector.

Although Finland's lowest tertiary level institutions did not, strictly speaking, become universities, the invention of the Finnish UAS system can be associated with academic drift (Clark, 1983, 221). As with many new, non-university HE institutions, Finnish UASs have faced challenges in gaining acceptance and recognition within the HE system (Ojala, 2017), despite their degrees being formally equivalent to those of their university counterparts. The establishment of the UAS system meant that the formal educational level of many lowest tertiary level degrees, such as the nursing degree, was raised to a level equivalent to university bachelor's degrees. From the viewpoint of the job competition model, the change can be seen as an attempt to raise the status of the degrees in question and, thus, improve the competitiveness of UAS degree holders in the labour market.

The current Finnish HE system most obviously resembles those of Germany, the Netherlands, Austria and Switzerland, as they all have clearly separated academic and vocationally oriented tracks (see Table 1). The Finnish term for UAS is a direct translation of the German term *Fachhochschule*. In terms of other Nordic countries, Sweden and Norway have recently transformed to unified systems, in which all institutions are regulated by the same legislation. However, a division still exists between the academically oriented universities and the more vocationally oriented 'university colleges'. In Norway, some university colleges have merged with or transformed into universities.

Table 1 A typology of selected European higher education systems (Kyvik, 2004; OECD, 2019)

	Binary system with separate university and non-university sectors	Unified system with the same legislative framework for all institutions
Mainly public institutions (less than 15% private)	*Austria, Denmark, Germany, the Netherlands, Portugal, Switzerland*	*Norway, Sweden*
Both public and government-dependent private institutions	*Finland, Belgium*	*The United Kingdom,*[a] *Spain*

[a]In the United Kingdom, a few independent private institutions receive less than 50% of their core funding from government agencies, and their teaching personnel are not paid by a government agency; however, the majority of institutions are private but government dependent (OECD, 2019)

Research task, data and measurement

Research task

The transformation of the Finnish HE system into a two-tiered binary system in the 1990s and 2000s increased the number of different degree types. From the point of view of our study, an essential aspect of these changes was that they complicated the formation of a 'labour market queue'. After the reform of the degree structure, employers were not able to use only the level of education (master's vs. bachelor's degree) and the field of education as indicators of the relative position of a job candidate; they also needed to consider the sector (university vs. UAS) from which the person had graduated.

To examine the positional competition in the Finnish labour market, we compared the influence of different 'degree types' on the probability of obtaining high-paid, high-status jobs. We included in our analysis both master's and bachelor's degree levels in all educational fields of both the university and UAS sectors. We particularly paid attention to how newly introduced UAS degrees were positioned in relation to the university master's degree, which has a well-established standing in the labour market (Isopahkala-Bouret, 2018). Furthermore, we focused on field-specific differences. Our research questions were formulated as follows:

1. What is the influence of different degree types on the probability of obtaining labour market success in terms of a high occupational status and income?
2. How are UAS degrees ranked in relation to university degrees in different educational fields?

Our prior theoretical discussion can be summarised as follows. Graduates with a higher level degree than others occupy a better position in the labour market queue (Thurow, 1975). Furthermore, professional and occupational groups use specific degree requirements as a social 'closure' to protect their own positions from job competition (Weber, 1978; Weeden, 2002). There are country-specific and field-specific differences in how strongly job competition is regulated by occupationally specific degree requirements (e.g., Bol & van de Werfhorst, 2013; Di Stasio, 2017). From these theoretical propositions, we can assume the following empirical implications:

Hypothesis 1: A master's degree (rather than a bachelor's degree) provides higher prospects of succeeding in the Finnish labour market. This applies to both the university and UAS sectors.

Hypothesis 2: Graduates with a university degree have a higher probability of obtaining labour market success than UAS degree graduates. This is because the professions and occupations that can effectively control access to good job opportunities via educational requirements (c.f., social closure) are more likely situated in the Finnish university sector.

Hypothesis 3: The rank differences between Finnish university and UAS degrees are greater in those fields that are regulated by credential social closure.

Nationally representative register-based data

We used register-based 5% samples of the 25–45-year-old higher educated Finnish population from 2010 to 2012 (pooled together), provided by Statistics Finland. The lower age limit was set as close as possible to the average HE graduation age in Finland. The upper age limit was set to limit the effect of seniority in the workplace and, thus, enable a more direct observation of the effect of education.

We pooled data from three years to even out slight changes from year to year and increase the number of cases, especially for the UAS master's degree level. Despite this, two UAS master's degree types had to be excluded from the analysis due to a low number of cases: 'humanities, arts and education' (41 cases) and 'science, agriculture and forestry' (seven cases). The 'unknown' category for the educational field variable was not interpretable in any meaningful way because of the low number of cases in this category (a total of 143 cases, or approximately 0.2%), so it was excluded, along with the educational field 'other/unknown'. The final size of the dataset was 63 486 cases.[3] Table 2 shows the frequencies in the data by field of education.

Measurement

The main independent variable in the statistical analyses was 'degree type'. It was constructed by combining the variables of educational level (master's or bachelor's), HE sector (university or UAS) and field of education (see Table 2). Due to data protection legislation, the classification of the fields of education in the data provided by Statistics Finland is coarse (the categories combine several fields of education). It should also be noted that the content of the educational fields varies between educational levels and sectors. For example, in Finland, the field of 'business, social sciences and law' is much more strongly tilted towards business in the UAS sector than in the university sector.

As we were interested in the extent to which graduates' degree types influence the probability of graduates attaining scarce, high-status, high-paid jobs, we defined the dependent variable as 'leading professional' (1/0). The variable refers to individuals who are

[3] The now extinct lower tertiary level, which was replaced at the turn of the millennium by the current UAS system, is omitted from the analysis, as are research-level degrees (i.e., Licentiate and PhD). In the field of medicine, the basic university degree is the Licentiate of Medicine. It is considered equivalent to the university master's degree level. There were 458 Licentiates of Medicine in the 2010–2012 data (2010: 149; 2011: 166; 2012: 143).

Table 2 Frequencies in the data by year and field of education

		2010	2011	2012	Total
Bachelor's/UAS	Hum/Edu	816	850	848	2 514
	Bus/Soc/Law	2 558	2 796	2 879	8 233
	Science/Agr/For	309	292	305	906
	Engineering	2 591	2 743	2 892	8 226
	Health/Welf/Serv	3 213	3 463	3 663	10 339
	Total	9 487	10 144	10 587	30 218
Bachelor's/university	Hum/Edu	781	848	810	2 439
	Bus/Soc/Law	389	387	428	1 204
	Science/Agr/For	127	173	148	448
	Engineering	57	104	101	262
	Health/Welf/Serv	182	199	248	629
	Total	1 536	1 711	1 735	4 982
Master's/UAS	Hum/Edu	7	13	21	41
	Bus/Soc/Law	26	41	47	114
	Science/Agr/For	–	4	3	7
	Engineering	32	49	44	125
	Health/Welf/Serv	41	91	96	228
	Total	106	198	211	515
Master's/university	Hum/Edu	2 737	2 714	2 787	8 238
	Bus/Soc/Law	2 512	2 644	2 642	7 798
	Science/Agr/For	1 155	1 128	1 135	3 418
	Engineering	1 862	1 968	1 903	5 733
	Health/Welf/Serv	880	860	844	2 584
	Total	9 146	9 314	9 311	27 771
Total/all		20 275	21 367	21 844	63 486

For the sake of brevity and clarity, in the tables and figures, the educational fields are abbreviated as indicated in the following list:

1. Humanities/Arts/Education: Hum/Edu
2. Business/Social Studies/Law: Bus/Soc/Law
3. Science/Agriculture/Forestry: Science/Agr/For
4. Engineering/Manufacturing/Construction: Engineering
5. Health/Welfare/Services: Health/Welf/Serv

employed in a leading white collar position[4] *and* belong to the highest wage quartile.[5] The variable targets a group of people who are well off in society based on several indicators.[6]

[4] Following Wright (1987, 88), we define leading white collar professionals as supervisors/managers who have professional expertise and authority over other employees in the organisation. White collar professionals (in general) would be defined as all (non-owner) experts. By definition, expert non-managers, supervisors and managers all have high levels of skill, but only the latter two have organisational power or assets.

[5] The highest wage quartile was calculated based on *gross wages* among higher educated individuals, separately for each year. Entrepreneur income was not included.

[6] While the final analysis was centred on the 'leading professional' variable, we did some preliminary tests and ran the logistic regression tables for the separate base variables (employment, highest wage quartile, leading white collar professionals and white collar professionals in general). The preliminary models on

Due to the dichotomous nature of the dependent variable, logistic regression was chosen as the method of analysis. Along with the main independent variable, which was (1) the degree type, we used the following control variables: (2) parents' education (at least one parent has a university master's degree); (3) gender (female = 1); and (4) age category (25–29, 30–34, 35–39 and 40–45). Some important variations were associated with the control variables in our data: University graduates had a higher parental background than UAS graduates; bachelor's degree graduates were, on average, younger than master's degree graduates (especially those from UASs); and graduates from the educational field of engineering, across both HE levels and sectors, were predominantly male.

In our logistic regression, four steps were presented, starting with only the degree type as the independent variable and then adding one control variable to the model at each step to observe its effect on the odds ratios (ORs) of the different types of degrees (see Table 3, columns 1–4).The OR is defined as the ratio of the probability of success and the probability of failure. We report ORs in comparison to the reference category, which is always marked with 1. ORs below 1 indicate a lower probability of incidence in comparison to the reference category (and vice versa). In addition, we report significance levels of independent variables, as well as Nagelkerke R squares, which can be interpreted as the proportion of the variance of the dependent variable explained by the independent variables. For example, a value of 0.20 would be interpreted as 20% of the variance explained. In addition, our data contained an occupation variable that was not included in our regression model but was used as additional information to interpret our results.

The SPSS syntax of the construction of the variables and the syntax of the statistical analyses are provided in Online Resource 1.

Empirical analysis

The results of our study showed that the prospects of being employed in a leading professional job vary greatly between different degree types in different fields of education. First, a master's degree provided higher prospects for labour market success than a bachelor's degree. This result was confirmed in all fields of education and in both the university and UAS sectors. Second, Finnish university degrees generally have a higher ranking in the labour market than UAS degrees, despite the formal equality of the qualifications. This means that our first and second hypotheses received support. In particular, the university master's degree clearly stands out from the other Finnish HE degree types. Furthermore, consistent with our third hypothesis, UAS degrees had relatively higher positions within those fields that were not regulated by occupationally specific degree requirements (c.f., social closure).

The influence of different degree types on labour market success

Our regression model was used to compare master's and bachelor's degrees in different educational fields, attained at either Finnish universities or at UASs. Table 3 shows the

Footnote 6 (continued)
professional status alone had lower explanatory power than our combined 'leading professional' variable, which included professional status and income variables.

Table 3 Leading professional: employed in a leading white collar position and in the highest wage quartile, odds ratios. Reference categories marked with 1

	(1)	(2)	(3)	(4)
Degree types				
UAS/Bachelor: Hum/Edu	0.039***	0.039***	0.042***	0.073***
UAS/Bachelor: Bus/Soc/Law	0.159***	0.160***	0.157***	0.252***
UAS/Bachelor: Science/Agri/For	0.073***	0.073***	0.058***	0.091***
UAS/Bachelor: Engineering	0.202***	0.204***	0.113***	0.183***
UAS/Bachelor: Health/Welf/Serv	0.037***	0.038***	0.054***	0.084***
Uni/Bachelor: Hum/Edu	0.027***	0.027***	0.035***	0.045***
Uni/Bachelor: Bus/Soc/Law	0.216***	0.216***	0.196***	0.314***
Uni/Bachelor: Science/Agri/For	0.148***	0.149***	0.112***	0.230***
Uni/Bachelor: Engineering	0.031***	0.031***	0.018***	0.101***
Uni/Bachelor: Health/Welf/Serv	0.132***	0.133***	0.155***	0.295***
UAS/Master: Bus/Soc/Law	0.297*	0.299*	0.354*	0.370
UAS/Master: Engineering	0.484	0.487	0.266***	0.254***
UAS/Master: Health/Welf/Serv	0.221***	0.222***	0.340*	0.307***
Uni/Master: Hum/Edu	0.158***	0.158***	0.193***	0.184***
Uni/Master: Bus/Soc/Law	0.835*	0.837*	0.797**	0.857*
Uni/Master: Science/Agri/For	0.331***	0.331***	0.276***	0.297***
Uni/Master: Engineering	0.873	0.874	0.527***	0.619***
Uni/Master: Health/Welf/Serv	1	1	1	1
Parents' education				
At least one parent has a master's degree		1.028	0.977	1.198***
Neither parent has a master's degree		1	1	1
Gender				
Male			4,103***	3,987***
Female			1	1
Age category				
25–29				0.052***
30–34				0.213***
35–39				0.631***
40–45				1
Nagelkerke R square	0.123	0.123	0.169	0.244

Significance levels: *** $p < 0.001$ ** $p < 0.01$ * $p < 0.05$

ORs for being both employed in a leading white collar position and in the highest wage quartile (combined). Our findings revealed that university graduates with master's degrees in the educational field of 'health, welfare and services' were by far the most likely to end up in a leading professional job. Therefore, this degree type acted as the reference category (OR = 1) in the logistic regression table.

Our regression model explained 24.4% (Nagelkerke R square 0.244) of the variance in the prospects for labour market success. All the control variables we used were statistically significant ($p < 0.001$) in the model. Table 3 clearly shows that graduates' parental education, gender and age had an impact independent of other background factors.

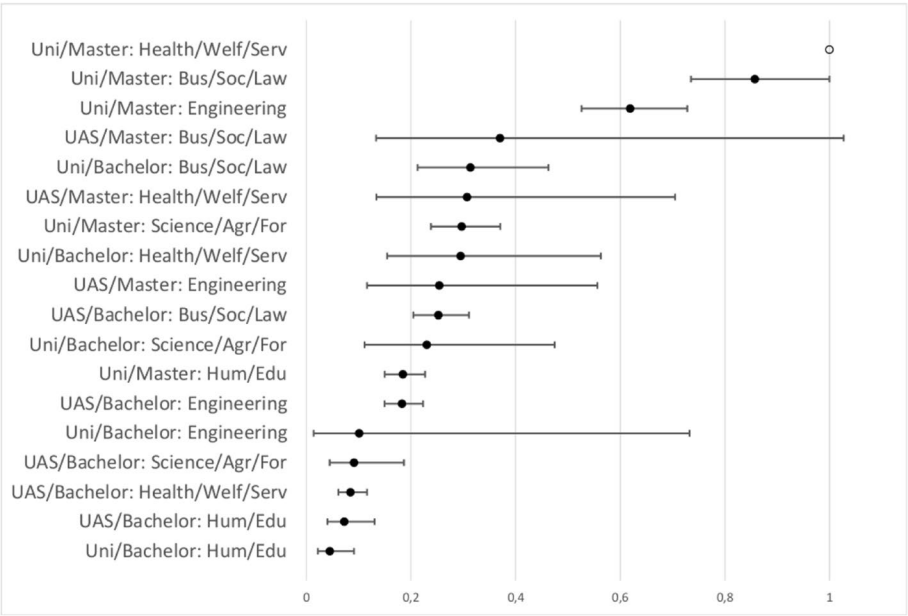

Fig. 1 Leading professional: Employed in a leading white collar position and in the highest wage quartile. Logistic regression, odds ratios (dots) and 95% confidence intervals (horizontal lines) in the categories of educational level, field and sector. Reference category (1) marked with a hollow dot. Based on the final model including all control variables

Furthermore, parental education did not have any effect on the Nagelkerke R square, and its effect on the ORs were very modest. Gender added some explanatory power and indicated that in general, there was approximately a four times greater probability of men ending up in the leading professional positions than women; however, the effect of gender on the ORs of different degree types varied greatly between fields of education. The age category brought about the largest leap in the explanatory power of the model. A 40–45-year-old graduate's likelihood of obtaining a leading professional job was approximately five times higher than that of a 30–35-year-old. This indicated that the probability of being employed in a high-status, high-paid job increases along with career progress.

Figure 1 illustrates the ranking of degree types regarding the prospects for ending up in the leading professional jobs. The ORs in the figure are the same as in Table 3 (the final model including all the control variables); in addition, we show 95% confidence intervals in the figure. Adding the control variables did not change the ranking of the different degree types.

The ranking demonstrated the well-known differences in labour market returns in different fields of study (Leppänen, 2019); for example, all the degree types in 'business, social sciences and law' ranked higher than any type of degree in 'humanities, arts and education'. The three highest-ranking degree types were all university master's degrees. The fourth one was a UAS master's degree. Likewise, the six lowest-ranking degree types were bachelor's degrees, including both university and UAS degrees. While the top and bottom degree types clearly differed from each other, in the middle, some

degree types had ORs close to each other and overlapping confidence intervals; thus, the rank order was not as established as in the top and bottom degree types. Finally, due to the rather low number of cases at the UAS master's degree level, the confidence intervals were fairly wide in all educational fields, which decreased the significance of the results regarding these degree types.

The field-specific variation in the relative position of graduates with different degree types

To further support our hypotheses, we focused on the field-specific variations in the ranking of degrees and the relative distance between the top and bottom types of degrees.

Health, welfare and services University graduates with master's degrees in the educational field of 'health, welfare and services' had the highest probability among all degree types of becoming leading professionals. In comparison, the graduates with UAS master's degrees had approximately a threefold lower probability of obtaining high-status, high-paid jobs (OR = 0.307). Generally, the prospects for graduates with a university bachelor's degree (OR = 0.295) seemed roughly equivalent to those for UAS master's degree graduates. Finally, for graduates with UAS bachelor's degrees, the prospects of attaining a leading professional job were low (OR = 0.084), with a wide margin when compared to their university counterparts.

Graduates with university master's degrees in this field were mostly (approx. 67%) medical doctors or other types of health professionals. An additional 12% worked in related teaching positions. Graduates with UAS bachelor's degrees worked mostly as registered nurses and specialists of social services. Furthermore, the relatively high ranking of university bachelor's degrees can be explained by the established position of two occupational groups for which the university bachelor's degree is a 'genuine' graduate degree: pharmacists and lieutenants. Pharmacists are mainly employed in private pharmacies as customer service workers, which requires extensive medical knowledge. A bachelor's degree in military sciences from the National Defence University was also included in the educational field of 'health, welfare and services'. These students are promoted to the rank of lieutenant upon graduating with a bachelor's degree and are employed full time in the defence forces, typically as instructors or platoon commanders. Unlike most individuals graduating with a bachelor's degree in other educational fields, they are guaranteed employment in a leading white collar position.

Business, social studies and law The university master's degree in the field of 'business, social studies and law' ranked second highest of all degree types. Graduates with these degrees had a 15% lower likelihood of ending up in the leading professional jobs (OR = 0.857) when compared to our reference category. The UAS master's degree in the field of 'business, social studies and law' ranked relatively well (OR = 0.370); however, the confidence interval was very wide, and the OR included 1, indicating no statistically significant differences ($p > 0.05$; see Table 3). Moreover, the educational field of 'business, social studies and law' ranked the highest among all bachelor's degrees; that is, for university bachelor's degrees, the OR was 0.314 and for UAS bachelor's degrees, it was 0.252. Interestingly, the margin between the different types of degrees in 'business, social studies and law' was much smaller than in the field of 'health, welfare and services' or 'engineering'.

The occupational profiles of graduates from both HE sectors were quite similar in the field of 'business, social studies and law'. In the UAS sector, the largest occupational group was business and administration professionals with a 25.7% share (26.8% in the university sector). In contrast, only 10.4% of the graduates with UAS bachelor's degrees were employed as business and administration professionals. Approximately 40% of them were employed in clerk/worker-type occupations.

Engineering, manufacturing and construction The university master's degree in 'engineering, manufacturing and construction' ranked third highest of all the degree types (OR = 0.619), with a wide margin to the rest of the degree types. UAS master's degree graduates in this field fell behind; they had more than a twofold lower probability of obtaining a leading professional job than university graduates (OR = 0.254). The opposite was true at the bachelor's degree level, where UAS degrees ranked higher than their university counterpart. A graduate with a bachelor's degree in engineering in the UAS sector had approximately a fivefold lower probability (OR = 0.183) of ending up in the leading echelons of the labour market, while the likelihood for a bachelor's degree graduate in the university sector was tenfold lower (OR = 0.101).

Among master's degree graduates, the largest occupational group was 'science and engineering professionals' with a 38.1% share in the university sector and a 34.6% in the UAS sector. Furthermore, once we included gender as a control variable in our regression model, the ORs of all degree types decreased. This indicated a gender bias in the largely male-dominated field of 'engineering, manufacturing and construction'. It should also be noted that at the university bachelor's degree level, the share of students was 27.9%, indicating that university bachelor's degree graduates in the field of engineering often continue to study further rather than entering the labour market full time, which partly explains the low probability of their being in the leading professional jobs.

Humanities, Arts and Education The graduates with master's degrees in the field of 'humanities, arts and education' had relatively low prospects of obtaining the leading professional jobs (OR = 0.184) in comparison with other university graduates with master's degrees. The UAS master's degree was excluded from the regression model due to a low number of cases. The UAS bachelor's degrees had a low influence on the graduates' probability of obtaining a leading, highly paid position (OR = 0.073); however, the lowest-ranking degree type of all was the bachelor's degree in 'humanities, arts and education' in the university sector (OR = 0.045). In comparison to the highest odds (i.e., the reference category), graduates with a bachelor's degree in 'humanities, arts and education' had more than a 20-fold lower probability of obtaining a leading professional position.

As the overall ranking of the field of 'humanities, arts and education' was relatively low (see Fig. 1), the margin between the top and bottom degree types *within* the field was not as wide as that within high-status occupational domains. The majority of graduates with a master's degree in education work as primary school teachers and those with a master's degree in humanities (e.g., literature, foreign languages and history) are often employed as subject teachers in secondary school. Teachers in Finland generally find full time employment and enjoy respectable status in society, although they work in the public sector and have modest salaries. The low ranking of the university bachelor's degree is, presumably, largely related to kindergarten teachers' qualifications; this is one of the few genuinely bachelor's level degrees in the university sector, but also one of the lowest-paid university

educated occupations in Finland. Furthermore, work organisations in the field of education are low in the hierarchy, and relatively few managerial/supervisor jobs are available.

Science, agriculture and forestry Graduates with master's degrees in the field of 'science, agriculture and forestry' had approximately threefold lower prospects of obtaining the leading professional jobs (OR = 0.279) in comparison with the reference category. In this field, the number of university master's degree graduates clearly exceeded the rest of the degree types (see Table 2). The UAS master's degree was excluded from the regression model due to a low number of cases. This educational field showed the smallest distance between the university bachelor's degree (OR = 0.230) and the university master's degree (with only a 0.05 difference between the ORs). The UAS bachelor's degree fell far behind its university equivalent, with more than a tenfold lower probability of obtaining a leading professional job (OR = 0.091) in comparison with the highest ranked degree type.

Discussion

In this study, we examined the positional competition in the binary system of HE in Finland. Our results showed that graduates' prospects of obtaining labour market success depended on how their educational credentials compared to other types of degrees in their field of education and in society. The fields of education differed in their labour market returns (Leppänen, 2019); moreover, the binary divide structured the opportunities to enter the high-paid, high-status jobs *within* different fields of education. Our results demonstrated how the degree rankings and the relative distance between university and UAS degree vary in different fields of education.

The results supported the assumption based on the job competition theory (Thurow, 1975) that master's degrees offer better prospects for success than bachelor's degrees when comparing the same sectors and fields (hypothesis 1). Although some exceptions were noted, the results also confirmed that university degrees offer better prospects for success than UAS degrees (hypothesis 2). The university master's degree ranked higher than the equivalent UAS degree in terms of the prospects of obtaining the leading professional jobs in the Finnish labour market. However, in some cases, university bachelor's degrees ranked lower than their UAS equivalents. For example, in the field of 'engineering and science', it seemed that the Finnish university bachelor's degree is, in reality, still an intermediary degree, which is reflected in its low labour market status.

Moreover, when we compared both master's and bachelor's university degrees to UAS degrees, we discovered that the position of the UAS master's degree sometimes seemed roughly equivalent to that of the university bachelor's degree. Thus, in the cross-sectoral analysis, a higher level degree (a UAS master's degree) did not provide better prospects for success than a lower level degree (a university bachelor's degree). In the field of 'health, welfare and services', the relatively high position of a university bachelor's degree was explained by the established status of 'closed' occupational groups of pharmacists and lieutenants. In the field of business, it seemed likely that the status of a university bachelor's degree was based on the potential and 'promise' of a graduate studying further and finishing a master's degree (Authors, under review).

The binary two-tiered degree structure most obviously regulated the relative positions of degrees in fields that contained 'closed' occupations (c.f., van de Werfhorst, 2011), particularly fortifying the status of university master's degrees against job competition. As

we suggested, the rank differences between university and UAS degrees were greater in the educational fields that contained 'closed' professions and occupations (hypothesis 3). The most obvious example in our analysis was the field of 'health, welfare and services', in which the existence of social closure benefitted university master's degree graduates, including medical doctors and social workers, while the UAS master's degree was not an 'earmarked' qualification for any profession or occupation. Finally, graduates with a high level degree in a field restricted by social closure had a double advantage over the competition. They were not limited to entering the profession or occupation for which their education had mainly prepared them; they were free to seek generalist jobs, for instance in management and administration.

Using the queue analogy of the job competition model, the existence of social closure means that recruitment into closed professions and occupations takes place from separate labour market queues (cf., Di Stasio et al., 2016). In such 'closed' queues, the level, sector and field of education are constant, meaning that they cannot provide an advantage for anyone in the positional competition. Therefore, the mechanisms of job competition come into play within the closed queue in special ways; it makes sense for the employer to choose the best possible candidate by considering factors such as work experience, informally acquired knowledge/skills and personality traits.

To conclude, graduates with non-university HE degrees have limited opportunities in the positional competition in the labour market. As a consequence, this may motivate sectoral transfers among bachelor's degree students as they continue their studies (Boer et al., 2010). In Finland, the number of university students with first degrees from UASs has grown. As the demand for these transfers has increased, European countries with binary systems have developed and implemented specific admission routes and instruments for graduates with non-university bachelor's degrees wishing to pursue master's degrees at universities (e.g., van Os, 2007). The trend of students crossing the sectoral boundary to improve their competitive position in the labour market may offer insights into the convergence between the university and UAS sectors. It is suggested that future research should critically investigate the possibility of non-university HE degrees providing access to rewarding, leading professional jobs—preferably in a comparative Europe-wide setting.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s11233-021-09070-8.

Authors' contributions Ulpukka Isopahkala-Bouret contributed to a full revision of the manuscript, framing of the theoretical background of the study and to the interpretations of the statistical results. Mikko Aro contributed to theoretical conception, design and implementation of the empirical study, and writing of the earlier version of the manuscript. Kristiina Ojala contributed to the description of the Finnish education system, and commenting of all versions of the manuscript.

Funding Open access funding provided by University of Turku (UTU). This work was supported by the Academy of Finland under Grant 315797.

Data availability The use of the data has been granted for a fixed time period by Statistics Finland. All identification information was removed from the data by Statistics Finland prior to its release. According to the license agreement, the data cannot be given to others by the licensee.

Code availability SPSS syntax of the variable transformations and statistical analyses is available as electronic supplementary materials.

Declarations

Conflicts of interest The authors declare that they have no conflict of interest.

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