



Barriers to attracting the best researchers: perceptions of academics in economics and physics in three European countries

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Abstract

Recruitment is one of the main strategic tools for universities, which aim to hire the best possible candidates for their academic positions. However, not every institution can hire whom they perceive as the best. Our paper investigates what are perceived to be the most pressing hindrances to attracting the best researchers. We focus on national and disciplinary differences in researchers' perceptions of barriers to recruiting the best scholars in their fields. We surveyed researchers in economics and physics in the Netherlands, Norway, and the UK and find that economists emphasize salary level and institutional prestige as the main barriers, while physicists underline competition from non-academic actors and career development opportunities. We further find differences by country. In Norway, limited institutional prestige is a key barrier to attracting the best researchers, while researchers in the UK highlight salary levels. Respondents at Dutch universities claim that they experience multiple, equally important barriers.

Keywords Excellence · Barriers to recruitment · Academic profession · Survey data · Cross-country study

Introduction

Recruiting those perceived as the most talented — or best — researchers has become a central part of the rhetoric surrounding excellence in research and related national and institutional policies and practices (Hazelkorn, 2015; Van den Brink et al., 2013). Simultaneously, the academic labor market is becoming increasingly internationalized, spurred by bodies like the European Union and the OECD promoting policies advancing the internationalization of academic labor markets. Accordingly, universities no longer compete for

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the best candidates solely at the national or regional level but increasingly on a global scale (Bozeman et al., 2001; Lepori et al., 2015; Musselin, 2004).

With the heightened focus on hiring academic talent and increased competition, attracting those perceived as the best scholars is becoming more challenging for universities (Paisey & Paisey, 2018; Van den Brink et al., 2013). Universities are also confronted with competition from other sectors that want to hire researchers, while challenging working conditions in academia have led scholars to opt out of university careers and turn to other sectors (Dorenkamp & Weiß, 2018; Opstrup & Pihl-Thingvad, 2016). Hence, hiring and retaining the best researchers are far from easy but nevertheless profoundly critical, because academics can be argued to be universities' most valuable resource, as they are responsible for universities' two main missions: teaching and research.

In this race for academic talent, countries' higher education systems operate under different premises with diverging supply and demand sides, academic career structures, and working conditions (Lepori et al., 2015). In some countries, national laws and regulations can complicate international appointments (Alfonso, 2016), while national career structures, wage levels, and working conditions can decrease the attractiveness of academic positions in others. Furthermore, national funding models can offer incentives and disincentives for hiring certain types of academic staff (Lee et al., 2013; Marques et al., 2017; Withley & Gläser, 2007). Moreover, the increased global competition among universities, as exemplified in international rankings (Brankovic, 2018), can affect the supply side of recruiting, with more prestigious universities attracting more and ostensibly better qualified applicants than their less prestigious counterparts. Research field and discipline also affect academic recruitment processes (Reymert, 2021), as different fields have their own formal and informal criteria for recruitment and promotion (Becher & Trowler, 1989; Clark, 1978; Whitley, 2000). For example, publication output is more highly valued in economics than in many other fields (Hammarfelt & Rushforth, 2017; Hylmö, 2018; Reymert, 2021). Today's academic labor market can thus be understood as a Chinese box that consists of different labor markets with supply and demand dynamics that vary by field and discipline (Reymert et al., 2020).

Despite the importance and complexity of recruitment processes, limited research has been conducted on the topic. There are few comparative studies (Fumasoli & Kehm, 2017), as most research focuses on individual countries (e.g. Hammarfelt & Rushforth, 2017; Levander et al., 2019; Nielsen, 2016; van den Brink et al., 2010). Moreover, research investigating the challenges related to hiring, especially potential barriers to recruiting, is also lacking. The present study seeks to fill this knowledge gap.

Exploring perceived barriers to recruitment from the viewpoint of those most directly involved — academics — is especially relevant for better understanding academic hiring processes. Not only do academics make up the applicant pool but they also play a core role in assessing and deciding on academic quality in recruitment (Langfeldt & Kyvik, 2011; Musselin, 2010; Reymert, 2021). This paper therefore investigates the following questions:

What do academic staff perceive as the most important barriers to recruiting the best possible candidates to academic positions?

To what extent can these barriers be explained by national or disciplinary differences?

To explore these questions, we have collected original survey data among academic staff in two disciplines — economics and physics — in three countries: Norway, the Netherlands, and the UK. The countries are all located in Northern Europe but were selected because they represent different national research and evaluation systems (Sivertsen, 2017;

Whitley, 2003), which may impact academics' perceptions of barriers to recruitment of academic staff. Furthermore, the countries have different degrees of prominence in the highly competitive and increasingly globalized academic labor market. Economics and physics are both research-intensive and internationally oriented disciplines, but they differ in knowledge type, organization of research, scientific practices, and modes of inquiry (Becher & Trowler, 1989). These disciplinary differences may also shape faculty perceptions of barriers to hiring.

Below, we describe recent changes in the academic labor market and offer an overview of the literature on national and disciplinary differences in academic recruiting. We then introduce the data and methods used in our study before presenting the empirical results. Our findings show that conditions of national research systems and disciplinary characteristics affect perceptions of the main barriers to recruiting the best scholars. Salary is an important barrier in economics and in the UK, while the limited international prestige of the institution is perceived as the main barrier in Norway and in physics. In the Netherlands, academics perceive the barriers of salary and limited international prestige to be on approximately the same level. We conclude the paper by discussing the results in light of the research literature, presenting the limitations of our study, and offering suggestions for further research.

A changing academic labor market

Academics have long been regarded as employees whose main driving force for work is intrinsic; they are perceived as dedicated to the search for scientific discovery and knowledge for its own sake. They are often described as guided by a scientific ethos featuring disinterestedness, organized skepticism, and rules of scientific conduct in which external motivational factors like remuneration are not important (Merton, 1973).

The actual working conditions of the contemporary academic profession, however, indicate that motivation within the profession is less idealistic. The social status of the academic profession is declining, and employment in academia is not as prestigious as it once was (Kenny, 2017; Langford, 2010). Higher education institutions place increasingly heavy demands on scholars and more frequently assess them using quantifiable metrics like scientific publications, student evaluations, and external funding (Leišytė, 2016). Working conditions are also becoming more precarious, with increasing uses of temporary employment and fiercer competition for tenured positions (Finkelstein, 2015; Whitchurch, 2019), which exacerbates work pressure while limiting the time in which scholars can conduct their own research and focus on career development. Overall, academic careers are becoming less attractive (Whitchurch, 2019), and a growing number of talented researchers are leaving academia for job security or a better work-life balance (Wöhler, 2014). This in turn is described as contributing to a decrease in intrinsic motivation (Dorenkamp & Weiß, 2018; Opstrup & Pihl-Thingvad, 2016). Today's academic staff thus tend to consider their work as more of a job, and salary has become a more important factor in choosing an academic career (Barcan, 2018).

These different dimensions of motivation for academic work do not describe a static state; rather, they result from underlying processes that are characterized by varying political and financial framework conditions, socialization, and other values underpinning the social and intellectual valuation of academic work (Antal & Rogge, 2020). Moreover, working conditions like *salary levels*, *workload*, *career advancement prospects*, and

competition from non-academic organizations can represent barriers for universities in their quest to attract great researchers. Even though these conditions vary across national, institutional, and disciplinary contexts, they emphasize that universities face an increasingly complex labor market.

With university rankings becoming ever more important, the prestige of a university can affect which researchers apply for positions, as placing higher in rankings can create additional visibility for a university (Brankovic, 2018). However, the institutional prestige of universities is not driven solely by hiring processes, and the relation between a university and whether an academic is perceived as the best could be argued to go either way. Recent studies in physics and sociology, for instance, have demonstrated the stability of prestige hierarchies in hiring processes, meaning that institutional prestige is a rather fixed aspect that does not change quickly even after prominent hires are made (Lee et al., 2021; Nevin, 2019).

Additionally, a university's ability to hire new staff — its rules and hiring processes — will affect who can be recruited, as hiring international researchers has proven to be more complicated in some countries (Alfonso, 2016). Academic recruitment has also been criticized as too rigid and unable to progress quickly enough to capture the best researchers (Thunnissen et al., 2013). Some universities have therefore implemented new recruitment policies that include more freedom to engage in active outreach to encourage specific desired candidates to apply for a position and even establish special arrangements for the most highly desired candidates (Thunnissen & Buttiens, 2017; Thunnissen et al., 2013). These policies have however been contested by academics themselves, many of whom regard this novel and more flexible way of hiring as threatening the long tradition of academic control over recruitment (Paisey & Paisey, 2018; Van den Brink et al., 2013).

Institutional prestige, the ability to hire new staff, and rigid hiring processes can thus also be barriers when universities search for the best researchers, but the impact of these barriers may differ between countries, institutions, and fields.

National differences in academic recruitment

Universities and academic staff are embedded in national higher education systems with their different laws, regulations, structures, and logics of recruitment, along with different academic career paths and policies for distributing research funding and evaluating performance (Cruz-Castro & Sanz-Menéndez, 2010; Fumasoli & Goastellec, 2015; Musselin, 2004, 2005). According to Whitley, (2003), national systems vary in terms of universities' autonomy vis-à-vis both the state and their academics. Autonomy concerns the extent of delegation of employment and resource control to scientific elites, the concentration of intellectual and administrative control within universities, the stability and strength of the hierarchy among universities, and the organizational segmentation of research goals and labor markets. In their study of different research and evaluation systems, Gläser et al., (2010) separate the “hollow organization” from the “employment organization,” with the Anglophone countries belonging to the latter. This model features more autonomous universities with control of budgets, personnel, and salaries. The former model is characterized by state control of budgets and personnel matters (including salaries) and is typical of Germany and the Nordic countries, although there have been some modifications in recent decades.

Furthermore, research systems may have weak or strong evaluation systems (Withley & Gläser, 2007). Evaluation systems are defined as “strong” when resources are distributed mechanically according to predetermined outcomes, with units of assessment often compared in transparent rating or ranking systems. These systems may affect perceptions of whom to hire in cases where the aim is to maximize performance and potential for gaining resources.

Additionally, national characteristics such as economic wealth and the perceived strength and prestige of a country’s research system appear to influence the capacity to attract academics in an increasingly competitive global labor market (Frølich et al., 2018; Lepori et al., 2015). National career opportunities may influence the attractiveness of academic positions, especially for tenured positions. National career systems differ in the length and nature of the pre-tenure period, the qualifications required to obtain a tenured position, and the valuation of experience by internal and external labor markets, that is, whether hiring is a question of success in systems other than one’s own or whether career development occurs within a university, using its rules and incentives for career advancement (Musselin, 2010; Whitchurch et al., 2021).

Hence, when investigating potential barriers to recruitment, we must consider national conditions, including the characteristics of national research and evaluation systems, as they may influence existing faculty’s perceptions of barriers to recruiting the “best” colleagues. One perceived barrier in a country may not exist at all in another. Still, there are limited comparative country-level studies of academic recruitment. One exception is Musselin, (2010), who uses empirical studies of the German and French higher education systems to show that recruitment practices differ in terms of devices for selection, such as whether recruitment is based on open competitions or certain quality criteria.

While some authors have emphasized national differences in academic recruitment, others have underlined the convergence of national higher education systems (Ramirez, 2006). For instance, supranational initiatives like the establishment of a common European Research Area have attempted to harmonize and ostensibly improve academic labor markets and facilitate recruitment both nationally and across borders (Chou & Gornitzka, 2014). These international trends have affected national career systems, with one concrete example being that several countries have introduced tenure track systems (Henningsson et al., 2017).

While national differences are important for understanding hiring processes, recruitment also takes place at the intersection of two other analytical levels. First, recruitments are expressions of organizational routines that occur within universities and thus of repeated and recognizable patterns within each organization (Fumasoli & Kehm, 2017). Moreover, universities within each country have different degrees of perceived prestige, which may influence the pool of applicants, and universities may have different routines of recruitment, wage levels, and working conditions. Recruitment processes can therefore differ significantly between universities in the same country. The last analytical level is academic discipline.

Disciplinary differences in academic recruitment

We know from a number of studies that academic disciplines form distinct communities with specific norms and criteria for evaluation (e.g. Reymert et al., 2020). Thus, disciplines also matter for recruitment processes. Given that they have their own formal and informal

criteria for recruitment, reflecting their community, culture, type of knowledge, and notions of quality (Lamont, 2009; Musselin, 2010), they can be argued to emphasize different qualities in an applicant (Reymert et al., 2020; Reymert, 2021). For instance, bibliometric indicators, teaching experience, and interpretive and technical skills are valued differently across the disciplinary spectrum (Hammarfelt & Rushforth, 2017; Herschberg et al., 2018; Levander & Riis, 2016; Musselin, 2010).

Differences between disciplines may be related to their fundamental characteristics. One way of capturing these comes from the conceptualization of scientific fields or academic disciplines as being divided between the dimensions hard versus soft and pure versus applied (Biglan, 1973). These four categories (hard-pure, soft-pure, hard-applied, soft-applied) have been asserted to be clear distinctions between knowledge domains with different objects of inquiry, nature of knowledge growth, working methods, and extent of truth claims (Becher, 1994). Moreover, fields and disciplines are argued to differ in terms of their internal organization of research, external relations, and academic output (Whitley, 2003). These differences imply that not only are academics in different disciplines evaluated by different norms and research standards but *how* they are evaluated also depends on the various modes in which academic work is conducted.

For instance, academics in STEM fields work more closely in collaborative projects with a more explicit division of labor and often need specific competencies to fulfill for a given role in a research group. The level of specificity required often results in narrower job announcement calls than is commonly found in, for instance, the social sciences (Reymert, 2021).

The disciplines also draw on different pools of candidates and thus operate in different labor markets with diverging career pathways. In disciplines like chemistry or physics, universities more frequently compete with industry to recruit the best researchers, and it is often reported that these fields can already experience challenges in recruiting PhD candidates (Borlaug et al., 2019).

Although disciplines can be understood as international systems that bridge national boundaries (Zapp & Lerch, 2020), they are nevertheless firmly embedded in institutional and national contexts (Henkel, 2005), which means varying conditions affect the recruitment of academic faculty. For the present study, national and institutional contexts and disciplinary communities are the relevant dimensions along which we will study differences in perceived barriers in hiring processes.

Context, data, and methods

Countries

This study focuses on three countries: Norway, the Netherlands, and the UK. They differ by size of higher education system and in autonomy. British and Dutch universities have relatively high autonomy compared to Norwegian ones (Gläser et al., 2010), implying that they have more influence over recruitment processes, working conditions, and remuneration of academic staff (Frølich et al., 2018; Sivertsen, 2017). The countries also represent different evaluation systems — all are so-called strong systems, but while the British and Dutch systems are based on peer review, the Norwegian system applies performance-based indicators related to scientific publications and external funding grants. Moreover, the Netherlands has abandoned the link between evaluation and funding (Gläser et al., 2010).

Norwegian higher education is part of the public sector and consequently subject to strong government control and funding decisions, including regulations regarding salaries. Hence, Norwegian higher education is comprised of what Gläser et al. (2010) call hollow organizations. The Netherlands also represents a rather regulated public higher education system and resembles the hollow-type. However, not as much as the Norwegian higher education system, which is even stronger publicly regulated. So, while both countries' universities are in the category of hollow organizations, the Dutch ones can be positioned closer to employment organizations compare to the Norwegians universities. UK higher education, on the other hand, is characterized by a large degree of institutional autonomy, with a highly competitive performance-based funding system at the institutional level. This funding system places more work pressure on individual researchers but gives UK institutions greater autonomy in setting salary levels and other aspects of academic working conditions. As a result, these organizations are more like the employment-type (Gläser et al., 2010). In contrast, the Norwegian system — at least in theory — provides legally and through welfare schemes a framework that enables a better work-life balance. All three systems are characterized by competitive labor markets that offer similar or even higher salaries outside academia (Metcalf et al., 2005).

The three countries further differ significantly in terms of scientific prestige and international visibility; the UK has a more elevated international status and is centrally located in the international academic labor market, while Norway could be described as less central and the Netherlands somewhere in between. Some British universities also rank highly in international rankings like the Academic Ranking of World Universities (Shanghai ranking).

Taken together, our country cases represent variations in university autonomy, type of research evaluation system, scientific prestige, and international visibility, all of which we expect to have an impact on the barriers that staff perceive as relevant when hiring scholars.

Disciplines

We selected respondents from economics and physics. In contrast to many disciplines in the humanities and social sciences, which tend to be national in outlook, economics and physics regularly cross-national borders and are therefore particularly valuable as empirical examples in comparative studies (Becher, 1994). At the same time, they differ significantly as to type of knowledge, epistemic tradition, and organization of academic work (Becher & Trowler, 1989; Whitley, 2003). While physics can be characterized as hard-pure, economics is (primarily) hard-applied, according to Becher's (1994) categories. As a type of knowledge, physics is cumulatively oriented, with an emphasis on the quantifiable and universal and on simplifying; as a research subject, it is thematically and theoretically fragmented. Physics is moreover a cost-intensive experimental discipline, largely international in its organization and collaboration patterns, and consequently characterized by many time-limited projects and positions, group-based work, and demanding academic careers (Karaulova et al., 2020; Laudel & Bielick, 2019). Like other STEM disciplines, physics is more closely linked to industry, and work experience outside academia is more common than in most of the social sciences (Borlaug et al., 2019; Reymert & Thune, 2022). Economics also has rigorous quality requirements, but it is a more monolithic discipline, with members sharing a common understanding of scientific quality and how it should be evaluated. The homogeneity within economics is visible, for example, in the widespread agreement over what are deemed top journals (Hylmö, 2018). Moreover, economics relies

less on large research teams and expensive experimental equipment. Rather, it is characterized by work that is either solitary or undertaken in smaller research teams. In addition, the emphasis on scientific publishing in top journals in economics gives scholars who succeed in publishing in them a significant career advantage. The two disciplines thus represent different categories of knowledge domains in which we expect academic faculty will have different perceptions of barriers to hiring the best colleagues.

Data, dependent variables, and independent variables

For data collection, we used a web-based survey in English that was distributed to academics in physics and economics at universities in Norway, the Netherlands, and the UK in 2017 and 2018. Our point of departure was to focus on regular academic staff, as we were interested in their perceptions as peers who are key actors on hiring committees (Musselin, 2010). As final hiring negotiations are conducted solely by various levels of leadership in some higher education systems, this methodological approach comes at the cost of not being able to compare barriers identified by academics in general from those highlighted by the leadership.

To create the sample, we collated respondents from both the journal classification in Web of Science (WoS) and universities' organizational units. In this operation, 59% of respondents were identified from institutions' staff lists and 41% from WoS data. When calculating the response rate, we deleted respondents who answered that they were unwilling to participate in the survey, those outside the target group, and those without working email addresses. We achieved an overall response rate of 30.6%, ranging from 11.7% for economists in the UK to 57.3% for economists in Norway and leading to a total of 718 respondents (see Table 1).

Since response rates differed between fields and countries, we conducted a response analysis. We used Gender-api.com, which identified the gender of 92.4% of the respondents by first name. This analysis revealed that women were slightly more likely to answer than men; 31% of women completed the questionnaire, while only 29% of men did the same. In the final sample, 79% of respondents were male, which reflects the gender balance in these disciplines. Accordingly, we concluded that we did not have an abnormal gender bias issue. Most respondents in the final sample were professors, with nearly half between 40 and 59 years old (see Table 1). The survey was part of a larger international research project, and we provide more information on the survey and its representativeness in the Appendix.

As the survey was distributed to the most relevant institutions and faculty with a minimum number of publications in relevant journals, all respondents were affiliated with institutions enjoying high or medium places in the Shanghai ranking of universities. However, the prestige of their institutions varied. Institutional prestige affects the supply and to some extent the demand side of recruitment, and we used the Shanghai ranking of universities and field-specific rankings to control for it. While we are aware that university rankings are not a neutral measurement of academic quality (Brankovic, 2018), we do acknowledge their discursive relevance in higher education. Even if they do not present unquestionably valid assessments of quality, they are widely treated as representations of prestige. To operationalize the ranking position, we divided respondents into those affiliated with "high-prestige universities" (Shanghai ranking between 1 and 100) and those affiliated with "medium-prestige universities" (Shanghai ranking between 101 and 901). For a discipline-oriented measure, we separated those in "high-prestige departments" (Shanghai discipline ranking between 1 and 100) and those affiliated with "medium-prestige departments" (Shanghai

Table 1 Descriptive statistics

Variable	Response rates	Weights	Count	Percentage	Total
<i>Country</i>					
Netherland			298	42	718
Economics	20.0%	1.04	115		718
Physics	24.2%	0.65	183		718
Norway			253	35	718
Economics	57.3%	1.21	99		718
Physics	49.4%	0.78	154		718
UK			167	23	718
Economics	11.4%	2.60	46		718
Physics	12.0%	0.99	121		718
<i>Age:</i>					
39 and younger			228	32	702
40 to 49 years old			167	24	702
50 to 59 years old			138	20	702
60 years and more			169	24	702
<i>Gender:</i>					
Female			152	21	718
Male			566	79	718
<i>Rank:</i>					
Assistant professor			228	32	716
Associate professor			149	21	716
Other			95	13	716
Professor			244	34	716
<i>University ranking:</i>					
Medium ranked			278	44	629
High ranked			351	56	629
<i>Field ranking:</i>					
Medium ranked			314	50	629
High ranked			315	50	629

discipline ranking between 101 and 500). Due to anonymity and European General Data Protection Regulation concerns, information about respondents' institutional affiliation was deleted for respondents from universities with fewer than 20 respondents. Hence, institutional affiliation data is marked as unknown for 87 respondents.

In the survey, respondents were asked to identify one or two of the most important barriers to recruiting the best researchers to their unit or department from seven predefined categories carefully selected identified from the literature referred to above:

- The salary level at my institution
- Career development opportunities at my institution
- The limited international prestige of my institution
- Not allowed to recruit new permanent staff
- High demands/work pressure at my institution
- Competition from non-academic organizations

- Rigid/slow hiring process at my institution

In an open text field, we also gave respondents the option of identifying other barriers they had encountered. They were also able to opt out of answering the question. The full questionnaire is available in the Appendix.

It is important to remember that we use perception-based assessments. At the same time, studies have found homophily bias in academic hiring processes, meaning that academics have a (not always conscious) preference for scholars who are similar to themselves (Kazmi et al., 2022). However, as our respondents had all been involved in hiring processes, their personal perceptions can be argued to have concrete relevance even if they are not objective. Our predefined barriers included aspects related to objective factors (e.g., salary levels, working conditions) and to subjective assessments thereof (e.g., expected salary level). This makes it difficult to disentangle objective from subjective factors. However, we argue that our approach is still feasible, because there is generally limited objectivity when studying perceived barriers in hiring processes, given that academics will weigh many different aspects of an offer while constantly updating their subjective assessments. We used logistic regression analysis and controlled for respondents' country of employment and academic field. We also controlled for respondents' gender, age, and academic rank.

Methods

The data were analyzed using R, with the results visualized using RMarkdown.¹ Different field sizes resulted in uneven group samples. Hence, to ensure equal field and country compositions in the bivariate data presentations, we developed and applied weightings (see Table 1).

We used stepwise binary logistic regression analysis with the perceived most pressing barriers as dependent variables, country, and field as independent variables, and age, gender, prestige, and position as control variables. Additionally, we controlled for interaction effects between field and country.² ANOVA tests were used to assess whether the independent variables contributed significantly to the variance of the dependent variable (Agresti, 2013). Akaike and Bayesian information criterion (AIC and BIC, respectively) tests were applied to determine the models that were most appropriate for explaining the variance (Agresti, 2013). Finally, we conducted a variance inflation factor (VIF) test to check for multicollinearity (Lin, 2008). We present the models with the best fit in the paper (Table 2); the other three are in the Appendix.

All regression models were run with the different countries as baseline categories. We have chosen to show the models with the Netherlands as the baseline. To display country and field effects on perceived barriers, we calculated the probabilities effects from the regression analysis. The field and country logit coefficients are also illustrated in dot-and-whisker plots, which display the differences between the coefficients. In these figures, the Dutch and economics coefficients are illustrated with dotted lines, while the other coefficients are marked with standard errors.

¹ The RMarkdown file is available on request.

² We also investigated each respondent's number of publications, mean citations scores, mean journal scores, and shares of publications in the top decile. This information was drawn from WoS. However, none of these variables had a significant effect.

Table 2 Binary logistic regression analysis with the most pressing barriers as dependent variable

		Dependent variables:						
		Salary	prestige	Non-academic competition	Work pressure	Career development	New staff	Rigid hirings
<i>Country:</i>								
	Norway	0.177 (0.215)	0.518** (0.227)	-0.346 (0.267)	-2.333*** (0.422)	-0.526** (0.233)	0.006 (0.232)	0.909*** (0.258)
	UK	1.408*** (0.229)	-1.483*** (0.424)	-0.659** (0.326)	-0.890*** (0.312)	0.061 (0.234)	-0.416 (0.275)	0.467 (0.301)
<i>Field:</i>								
	Physics	-1.226*** (0.186)	-0.827*** (0.214)	0.840*** (0.276)	-1.004*** (0.250)	0.587*** (0.213)	0.918*** (0.239)	0.272 (0.236)
	Female	-0.697*** (0.243)	0.419* (0.249)	-0.902** (0.360)	0.068 (0.319)	-0.179 (0.245)	0.560** (0.237)	0.161 (0.265)
<i>Age:</i>								
	40–49	-0.193 (0.307)	-0.152 (0.323)	-0.156 (0.371)	0.410 (0.408)	0.555* (0.314)	0.290 (0.341)	0.030 (0.352)
	50–59	-0.175 (0.354)	-1.049** (0.420)	-0.206 (0.444)	0.653 (0.506)	0.904** (0.379)	0.822** (0.406)	-0.787* (0.459)
	60+	-0.681* (0.370)	-1.345*** (0.442)	-0.301 (0.466)	1.181** (0.513)	0.666 (0.407)	0.659 (0.437)	-0.327 (0.445)
<i>Rank:</i>								
	Associate prof	-0.622** (0.269)	-0.464 (0.311)	0.669** (0.330)	0.178 (0.397)	0.585** (0.298)	-0.191 (0.324)	-0.140 (0.338)
	Assistant prof	-1.010*** (0.343)	-1.075*** (0.386)	-0.180 (0.440)	0.553 (0.469)	1.160*** (0.364)	0.724* (0.383)	-0.102 (0.408)
	Other	-0.453 (0.297)	-0.929** (0.455)	-0.498 (0.463)	0.434 (0.377)	0.246 (0.334)	-0.684* (0.393)	0.023 (0.379)
	Constant	0.387	-0.134	-2.033***	-1.579***	-2.564***	-2.729***	-2.181***

Table 2 (continued)

Dependent variables:									
Salary	prestige	Non-academic competition	Work pressure	Career development	New staff	Rigid hirings			
Observations	(0.386) 700	(0.504) 700	(0.522) 700	(0.437) 700	(0.473) 700	(0.487) 700			
Log likelihood	-381,445	-250,527	-221,824	-345,749	-312,745	-283,788			
Akaike Inf. Crit	784,891	523,054	465,647	713,498	647,490	589,576			

Baseline categories: country (*the Netherlands*), field (*Economics*), gender (*male*), age (*under 40 years old*), position (*professor*)

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Results

Salary levels at the academics' institutions were most frequently identified as the most pressing barrier to recruitment, with 38% of respondents identifying this barrier as the most important barrier. Career development (20%), limited international prestige (18%), and not being allowed to recruit more staff (16%) were also often noted as the most important barriers.

In the open question, 5% of respondents mentioned the location of their institution as a key barrier. For respondents in Norway and the Netherlands, these problems were mostly related to the country's relative geographical remoteness; for example, one Norwegian respondent answered, "Geographical location, far from European mainland." However, in the UK, these concerns were mostly related to (hostile) immigration laws reflected in answers such as "Home Office barriers for immigrants to UK" or "Brexit." In addition, 4% of respondents specified funding challenges related to overhead costs imposed by the institution, limited funding for PhD students, postdoctoral researchers, and equipment, or a lack of startup funding for incoming faculty. In any case, all these aspects were less emphasized by respondents than the predefined categories, so we omitted them from further statistical analysis.³

Perceptions of the most pressing barriers were influenced both by researcher field and country of employment. While half the respondents in economics identified salary at their institution as the most pressing barrier, only a quarter of physicists did the same. Economists cited their institution's limited international prestige as the most pressing barrier twice as often as physicists, whereas career development was mentioned as the most pressing barrier by 25% of physicists but only 15% of economists.⁴ As to national differences, salary level was the most pressing barrier for more than half of British respondents but only a third of Norwegian and Dutch respondents. Limited international prestige was primarily a Norwegian phenomenon, with 29% citing it as the most pressing barrier, compared to only 6% in the UK. Similarly, heavy work pressure from the institution was a barrier mainly identified by academics at Dutch institutions, with 10% of respondents mentioning it, compared to only 2% in Norway.⁵

Regression analysis

The descriptive field and country differences were confirmed by binary logistic regression analyses using the seven predefined barriers as the dependent variables (Table 2). The results indicate that being an economist rather than a physicist increases the probability of identifying salary as the most pressing barrier from 26 to 55% and limited international prestige from 25 to 43% (see Fig. 1).⁶ In contrast, being an economist instead of a physicist decreases the probability of identifying career development as a pressing barrier from 19 to 12% and the probability of identifying competition from non-academic organizations from

³ An overview appears in the Appendix.

⁴ A full overview appears in Fig. 2 in the Appendix.

⁵ A full overview appears in Fig. 3 in the Appendix.

⁶ To present concrete changes in probabilities, it is necessary to keep control variables constant. Thus, the effects were computed for male Dutch professors aged 50 through 59.

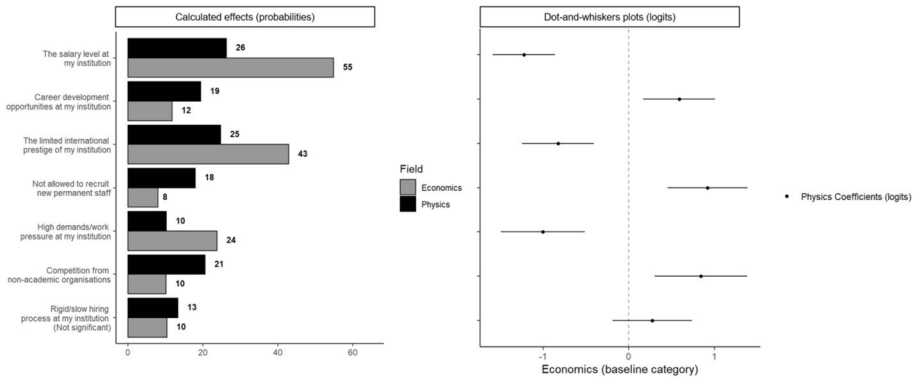


Fig. 1 Calculated field-effects (possibilities) and field-coefficients (logits) with standard errors from the regression analysis. *Possibilities for identifying barriers as pressing for male professors in the Netherlands between 40 and 49 years old

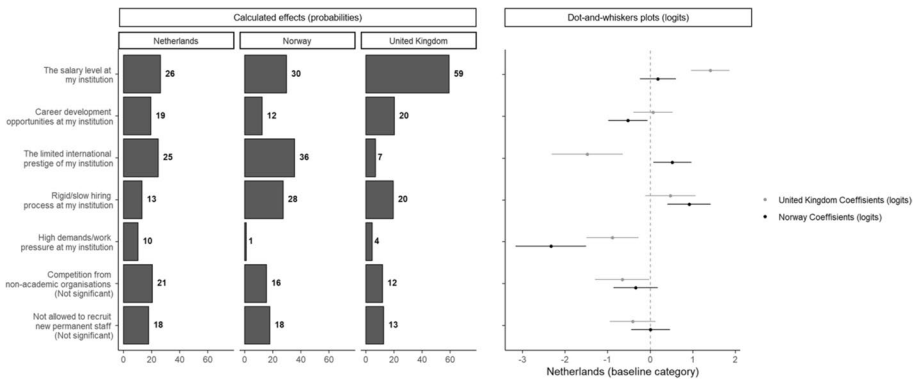


Fig. 2 Calculated country-effects (possibilities) and field-coefficients (logits) with standard errors from the regression analysis. *Country differences in possibilities for identifying barriers as pressing for male professors in physics between 40 and 49 years old

around 21 to 10%. The difference in probabilities between physicists and economists of identifying rigid and slow hiring processes as key barriers was not significant.⁷

The binary logistic regression analysis further confirmed that the perceived barriers were highly country-dependent (see Table 2). The ANOVA test showed that all barriers were dependent on country, except for competition from non-academic organizations and not allowing to recruit new staff, where country did not have a significant effect when controlled for field and other variables (see Fig. 2). In Fig. 2, the Netherlands (the dotted line) serves as the baseline, while Norwegian and British respondents are marked with standard errors. The results demonstrate clear differences between the countries. The regression

⁷ These field differences were confirmed when controlling for both university prestige and department/field prestige. Even models excluding respondents from the UK showed similar results (see Tables 5 and 6 in the Appendix).

analyses revealed that working at a British rather than a Dutch university increased the probability of identifying salary level as a key barrier from 26 to 60% (see Fig. 2),⁸ while working at a Norwegian rather than a British university increased the probability of identifying limited international prestige of the institution from 7 to 36%. Furthermore, there was a significantly higher probability of identifying high demands and work pressures for Dutch respondents than for Norwegian or British ones. Researchers at Norwegian universities were also more likely to identify rigid and slow hiring processes than their Dutch and British colleagues.

The regression analysis further revealed that belonging to a high-prestige university decreased the likelihood of mentioning salary as the most pressing barrier and increased the probability of citing career development (see Appendix Table 4). However, when running these models without British respondents — since all British institutions were categorized as high in prestige — this effect disappeared (see Appendix Table 7). In these models, belonging to a high-prestige university decreased the likelihood of mentioning non-academic competition, work pressure, career development, hiring new staff, and rigid hiring processes as key barriers. Given the varied results and considering that rankings are only a rough measure of prestige, caution should be exercised when interpreting these findings. However, we conclude that controlling for prestige did not fundamentally change the field or country effects we have identified.

We also controlled for interaction effects between academic fields and countries, but these did not have significant effects, aside from identifying high demands and work pressure (see Appendix Table 3). This effect was largely explained by very few Norwegian respondents mentioning high work pressure as a key barrier. High work pressure was mainly observed among Dutch and British economists, followed by Dutch and British physicists.

In addition to discipline and country differences, we controlled for gender, age, and academic rank. While gender differences were moderate, we found that female researchers were less inclined to mention salary and non-academic competition as barriers to recruiting the best researchers but more likely to identify restrictions on recruiting new staff (see Table 2). There also was not an especially clear age division, except for researchers aged 60 years or older being less likely to refer to a lack of prestige and more likely to mention work pressure. Likewise, associate and assistant professors were more likely to cite career development and less likely to identify salary as pressing barriers. Additionally, assistant professors were significantly less likely to mention a lack of prestige than full professors, and associate professors were more likely to mention non-academic competition.

Discussion and conclusion

We have examined a set of barriers to recruitment and how academics in physics and economics at universities in three European countries perceive them. Our results show that academics perceived salary levels, possibilities for career advancement, and institutions' international prestige as the main barriers to hiring the best researchers. However, our results also reveal both disciplinary and national differences in perceptions of barriers to

⁸ To present concrete changes in probabilities, it is necessary to keep control variables constant. Thus, the possibilities were calculated for male physics professors aged 40 through 49.

elite recruitment, which helps enrich our understanding of the increasingly complex context of academic recruitment.

First, the results point to national differences. Although some argue that universities around the world are becoming increasingly similar (Ramirez, 2006), our results affirm that it is still important to account for the conditions of national research systems (Whitley, 2003), as they can act as filters for global trends (Christensen et al., 2014; Musselin, 2005).

Our study shows that academics in the UK perceive salary levels to be by far the biggest barrier. While their colleagues in Norway and the Netherlands also report this as an important hindrance, other factors are more important in those contexts. In Norway, international prestige appears to be the biggest challenge, whereas academics in the Netherlands identified high work pressure as the most urgent barrier.

The emphasis on salary levels as the main barrier in the UK might be explained by the fact that researchers do not perceive the other predefined alternatives as barriers to elite recruitment. Alternatively, British universities are employment organizations (Gläser et al., 2010) with more autonomy to negotiate salaries (Estermann et al., 2011), which can create larger pay differences within universities. In contrast, Norwegian universities are state-owned hollow organizations (Gläser et al., 2010), where salaries are to a larger degree regulated and there is a high level of wage compression. While salary is an issue, the lack of international prestige of the institutions was perceived as a more significant barrier by respondents in Norway. That Norwegian respondents more frequently mentioned a lack of international prestige as a barrier than British respondents could similarly be explained by the national context emphasized by Whitley, (2003), as UK institutions generally place higher in international rankings than universities in either Norway or the Netherlands, and by Norway's remote location. These two barriers are also intertwined, as those who are perceived as the best researchers and might make higher salary demands could be less likely to apply for positions at less prestigious universities.

We also found that Dutch researchers highlighted work pressure as the most pressing barrier. This finding is in line with earlier studies of Dutch academia, which show that the balance between teaching and research is especially challenging in the Netherlands and leaves less room for research (Leišytė, 2016). Norway's work-life balance policies could, along the same line of argument, explain why respondents there less frequently mentioned work pressure as a barrier.

Second, we find substantial disciplinary differences in academics' perceptions of barriers. These differences can be related to the social organization of science, as research in physics is generally performed by larger groups, whereas economics does not have the same reliance on other academics with distinct and complementary skills (Becher, 1994; Whitley, 2000). In this way, physicists' perceptions of career development as a larger barrier may reflect the fact that it can be difficult to stand out in a large group. Moreover, the higher degree of specialization in terms of technical skills among physicists can make it harder to reframe one's research profile and become more competitive for a broader set of positions and through this advance one's career.

These disciplinary differences could also be related to different status hierarchies. Academics in both economics and physics perceive salary and international prestige as key recruitment barriers, but economists do so to a much larger extent. Economics is known for being a hierarchical and insular discipline (Fourcade et al., 2015). Our findings confirm this perception, and that salary appears to be an important tool for attracting the best economists. We also observe that physicists to a larger extent perceive competition with non-academic employers as a barrier. This indicates that challenges to recruiting come not only from within the higher education sector or public regulators but also from the wider job

market. Studies of university–industry interactions have emphasized the close ties between physics and non-university environments, whereas economics and other social sciences often have the public sector as their main competitor for talent (Abreu & Grinevich, 2013; Thune et al., 2016).

Our results highlight that although the academic job market is increasingly perceived as international (Finkelstein & Jones, 2019), there are still important national and disciplinary conditions and variations that need to be considered by universities aiming to enhance their recruiting (Musselin, 2005). Our results suggest that Norwegian universities could, for example, benefit from improving their hiring systems, more specifically by reducing the time it takes to finalize recruitment processes. Similarly, UK and Dutch universities could improve academics' career development opportunities by offering clearer paths to permanent positions (Kenny, 2017).

Recruitment is a key tool for the strategic management of universities, and hirings of tenured faculty members are among the most consequential routine decisions made in higher education. A full awareness of barriers in hiring processes, including disciplinary and national conditions and variations between them, is highly relevant not only for universities and their leadership but also for individual academics participating in hiring processes. Our results offer valuable initial insights into this complex issue.

In addition, we have limited knowledge of how higher education institutions use their room to maneuver in recruitment issues in today's increasingly globalized competition for the best researchers. It is reasonable to believe that institutions are frequently faced with dilemmas in recruiting academic staff, as they have to deal with different and sometimes conflicting logics: the quest for external funding, excellence, and productivity in both research and teaching versus the need to complete service tasks and accommodate policy expectations (Reymert, 2021). Our findings underline that today's researchers are not driven solely by intrinsic motivation, although prestige is certainly important. Extrinsic elements like salaries and working conditions are also central factors. This supports previously observed trends in a changing academic labor market where academics consider their work to be a job to a larger degree than they once did (Barcan, 2018). We believe that these conditions need more attention in future studies of research, scholarly groups, and academic recruitment.

Our study has certain limitations. The first is survey design. We asked for barriers to recruitment of the best researchers. This means that we left respondents free to define "best researcher" and opened the possibility of varying interpretations. At the same time, using a hard criterion like being a Nobel laureate would have created a different type of systematic bias, as hiring these kinds of scholars might be too unrealistic for many universities. Additionally, we included a limited set of barriers from which respondents could choose. However, we also gave them the opportunity to add more barriers through an open response option, though that was only used to a limited extent. Thus, we are confident that we did not miss an important barrier in the list we provided. We also had some challenges regarding the number of responses per university, which prevented us from analyzing our data at the institutional level to map differences between universities in the same country. However, controlling for the prestige of the university served this purpose to some extent. Finally, our survey focused mainly on academics and did not specifically target other groups, such as university, faculty, or department leadership. While these respondents might have a more strategic outlook on their units and might be the ones leading or at least playing an important role in the final stages of contract negotiations, we believe that our sample is still relevant. Collegial hiring processes remain a cornerstone of academic self-governance, so gathering information on the perceptions of academics as key actors in

these selection processes provides us with important information. At the same time, investigating insights from leadership would be valuable follow-up research.

Furthermore, it would be desirable to broaden the disciplinary and geographical scope of the analysis by including more country contexts and/or disciplines. For instance, it would be interesting to investigate the relation between international fields and those with a more national scope, and future studies could include disciplines like law that are heavily characterized by national research questions and needs. Similarly, having a higher response rate per university would allow comparisons between universities in the same country, which could reveal even more about the role of institutional prestige and certain geographical factors. Finally, future studies could also investigate trade-offs between different barriers and institutional responses to address the challenges that have been identified. For example, universities that are more remotely located or less prestigious may try to compensate for that through more generous salary policies or better working conditions like more time for research, which would shape the perceived barriers by academics in these institutions. Overall, our study shows that studies of academic hiring should pay more attention to barriers in recruitment processes because they can help explain patterns of academic employment and inform both universities and academics about areas for improvement.

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Declarations

Conflict of interest The authors declare no competing interests.

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