Academia in Transition: Empirical Evidence from Business Researchers

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I. General Introduction

Academia has been subject to constant change in recent years. In particular, the introduction of market-based structures and the implementation of performance-based funding decisions, often summarized under the term 'New Public Management', have affected researchers in a variety of ways (Hicks 2012; Schmoch and Schubert 2010; Schubert 2009). This dissertation deals with transitions that have shaped the academic labor market. The focus here is, exemplarily, on business researchers in German-speaking countries. Based on a unique, hand-collected data set, four articles address changes that business researchers have faced during the past thirty years.

The first article "Publication Behavior in Different Fields of Business Administration: From Anecdotal to Empirical Evidence" investigates into the publication behavior (e.g. regarding the focus on practitioner journals or the focus on particularly renowned journals) of business researchers who operate in different business administration fields such as accounting or finance. The analysis of such differences contains important implications regarding the allocation of funds in business administration faculties that are often based on the professors' research output (Sieweke et al. 2014). The findings show significant differences in publication behavior across different business administration fields and highlight that especially accounting professors tend to publish differently when compared to their peers in other fields. Among other aspects, they publish more often in practitioner journals and less often in internationally renowned journals. The article discusses that these differences might lead to disadvantages concerning resource allocation within business administration faculties and, hence, should be considered when evaluating the research output of business researchers.

The second article "The Times They Are a-Changin': Profiling Newly Tenured Business Economics Professors in Germany over the Past Thirty Years" analyzes how profiles of newly tenured business researchers, who were exposed to reforms associated with New Public Management, have changed over time. The results reveal that business researchers

have become more diverse (e.g. regarding their gender or the internationality of their education) and that their professional networks have increased significantly over time. Most importantly, however, the article shows that tenure requirements concerning publications in highly renowned international journals have changed as well, i.e. in order to obtain a tenured professorship today, more publications in highly renowned journals are necessary compared to thirty years ago. This article provides important practical implications, particularly for junior business researchers who strive to become a tenured professor.

The third article "Closing the Gender Gap in Academia? Evidence from an Affirmative Action Program" investigates the causal effect of an affirmative action program, i.e. the so-called *Professorinnenprogramm* in Germany. This program intends to increase the fraction of newly tenured female professors in order to close the gender gap in the academic labor market (Löther 2019). The findings of this article reveal that this program was successful in German business administration faculties. More precisely, the article shows that the probability that a newly tenured professor is female increases at universities that participate in this program when compared to universities that do not participate. Furthermore, the article delves deeper into the mechanisms of the program and shows that the program has lowered the entry barrier regarding the publication records for new female professors while not impacting the publication records of new male professors.

The fourth article "How do researchers react to changing incentives? Causal evidence from a journal ranking update" focuses on the incentive effect of journal rankings. Journal rankings become increasingly popular, for example, to objectify hiring decisions or to allocate funds within business administration faculties and thus publications in highly ranked journals are often referred to as "the currency" in academia (Aguinis et al. 2020; Osterloh and Frey 2020; Drivas and Kremmydas 2020). Despite a growing body of literature in this field, our knowledge on whether and how journal rankings actually affect researchers' publication behavior is still limited. This article analyzes the response of business researchers located in the German-speaking countries to the update of the most prominent German business journal ranking and provides causal evidence that researchers

actually respond to journal rankings by adjusting their publication behavior accordingly. Furthermore, the results indicate that especially younger researchers and those with stronger publication records respond more strongly. Hence, this article contains important implications for university managers and policy makers who intend to steer researchers' publication behavior.

Overall, this dissertation presents how the academic labor market in German-speaking countries in general, respectively the academic labor market for business researchers in particular has changed over time. The reforms associated with New Public Management have impacted academia in a variety of ways and this dissertation provides empirical – partly even causal – evidence how these reforms have changed the way research is conducted and how they have impacted hiring decisions of universities. As a result, this dissertation offers important insights for researchers, higher education managers, and policy makers going into the future.

References

Aguinis, Herman, Chailin Cummings, Ravi S. Ramani, and Thomas G. Cummings. 2020. "An A Is An A": The New Bottom Line For Valuing Academic Research. *Academy of Management Perspectives* 34 (1): 135–154.

Drivas, Kyriakos, and Dimitris Kremmydas. 2020. The Matthew effect of a journal's ranking. *Research Policy* 49 (4).

Hicks, Diana. 2012. Performance-based university research funding systems. *Research Policy* 41 (2): 251–261.

Löther, Andrea. 2019. Is it working? An impact evaluation of the German "Women Professors Program". *Social Sciences* 8 (4): 116.

Osterloh, Margit, and Bruno S. Frey. 2020. How to avoid borrowed plumes in academia. *Research Policy* 49 (1).

Schmoch, Ulrich, and Torben Schubert. 2010. Strategic steering of research by new public management in German universities: a looming state–science conflict? *Research Evaluation* 19 (3): 209–216.

Schubert, Torben. 2009. Empirical observations on New Public Management to increase efficiency in public research—Boon or bane? *Research Policy* 38 (8): 1225–1234.

Sieweke, Jost, Johannes Muck, Stefan Süß, and Justus Haucap. 2014. Forschungsevaluation an Universitäten - Ergebnisse einer explorativen Studie rechts- und wirtschaftswissenschaftlicher Fakultäten. *Schmalenbachs Zeitschrift für betriebswirtschaftliche Forschung* 66 (4): 274–305.

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Publication Behavior in Different Fields of Business Administration: From Anecdotal to Empirical Evidence

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Abstract – In this paper, we substitute anecdotal with empirical evidence regarding the publication behavior of German business administration professors. We find that in particular the publication behavior of accounting researchers differs strongly from the publication behavior of researchers in other business administration fields with respect to (i) the national focus, (ii) the focus on practitioner journals, (iii) the focus on particularly renowned journals, and (iv) the holistic publication output. More precisely, we document that accounting professors have a stronger national focus, publish more in practitioner journals, and publish less in particularly renowned journals. Overall, our analyses document distinct differences in publication behavior across the fields of business administration, which should presumably being considered when evaluating the publication portfolios of professors across fields, e.g., in the context of resource allocation in business administration faculties.

Keywords: Business administration, journal rankings, journal ratings, publication behavior, research evaluation

JEL Codes: A14, I23, M10

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1. Introduction

Research evaluation is an important topic in academia in general and in business administration in particular. The importance of research evaluation stems from the fact that researchers are evaluated at many points in their careers with respect to their research output. These instances include, for example, obtaining the first tenured position, but also the allocation of competitive third party funding[1] or the distribution of resources within a faculty (Graber et al. 2008; Hudson and Laband 2013; Mingers and Willmott 2013; Beckmann and Schneider 2013; Hicks 2012). In particular, the performance-based allocation of resources within university faculties has gained relevance in Germany (Brähler and Strauss 2009; Hornbostel 2006; Münch 2008; von Görtz et al. 2010). E.g., Sieweke et al. (2014) document that 85.7% of the business administration and/or economics faculties in their sample allocate financial resources based on the professors' research output. However, the allocation of resources within a business administration faculty based on the professors' research output rests upon the premise that a fair evaluation of research output across multiple fields of business administration is given. Yet, there is anecdotal evidence that suggests that publication behavior differs across business administration fields, with a particularly distinctive position of accounting researchers. These differences in publication behavior might hamper a fair performance-based allocation of funds if these differences are not considered in the measurement of publication output. Thus, our paper fosters knowledge regarding the quantitative evaluation of these behavioral differences – with a particular focus on accounting researchers – by replacing anecdotal with empirical evidence, i.e., by actually quantifying these behavioral differences.

While publication behavior can comprise numerous aspects like the structure of the professional networks, the common length of a publication or the relevance of other outlets besides academic journals (e.g., conference proceedings (Vardi 2009, 2010)) we focus on

[1] With competitive third party funding, we refer to third party funds that researcher acquire by passing through a competitive process, for example when applying for funds at the German Research Foundation (DFG).

four particular research questions in our paper and focus on journal publications exclusively. First, we analyze if fields of business administration differ with respect to a focus on a national audience. Anecdotal evidence suggests that in some fields such as accounting, national topics are more important than in other fields. In particular, financial accounting and taxation are more concerned with German law than other fields. In contrast, fields like marketing are usually less focused on topics of national interest and thus might primarily conduct research for an international audience. Therefore, we compare professors in different fields of business administration with respect to the share of publications with a German title and the share of publications in journals, which are based in the DACH region, subsequently called DACH region journals. Given that German accounting professors are particularly concerned with German (tax) law, we expect that accounting professors should possess a more pronounced national focus compared to their peers in other business administration fields. Hence, our first research question asks whether accounting professors have a stronger national focus compared to professors in other fields.

Second, we study potential differences regarding the focus on so-called practitioner journals. There is initial evidence that practitioner journals are important for researchers in financial accounting (Fülbier and Weller 2011), while other fields usually do not publish papers for a practitioner audience. In order to address whether the fields differ with respect to papers published for a practitioner's audience, we identify practitioner journals and calculate the fraction of publications in these journals divided by all publications of a professor. Subsequently, we compare respective fractions across the fields of business administration. Consequently, our second research question asks whether accounting professors publish a larger fraction of their work in practitioner journals compared to their peers in other fields.

With our third research question, we investigate if fields of business administration differ with respect to publishing in the most renowned journals. Publications in such journals are typically one criteria for the distribution of funds in business administration faculties. More precisely, we focus on journals included in the *Financial Times' top 50 journals (FT50)* (Fassin 2021; Vidgen et al. 2019; Zhang 2021) and highly rated journals

according to the *VHB Jourqual 3 (JQL3)* (see, e.g., Eisend (2011) and Schrader and Henning-Thurau (2009) for discussions regarding earlier versions of this ranking). Previous research shows that in some fields of business administration it might be more difficult to publish in highly rated journals compared to other fields. Since the seminal work of Buchheit et al. (2002), there is a steadily growing body of literature providing evidence that it is more difficult to publish in top-tier accounting journals compared to other business administration fields (Swanson 2004; Swanson et al. 2007; Templeton and Lewis 2015; Valacich et al. 2006). Most recently, Grossmann et al. (2019) provide evidence that accounting researchers have the least opportunities to publish their work in highly rated journals[2] when compared to management and finance researchers. For example, the authors show that the average number of A-star articles (according to the ABDC journal ranking) per faculty member in accounting equals roughly 0.2, whereas this number equals roughly 0.5 in finance and 1.5 in management.[3] In addition, Korkeamäki et al. (2018) find that the "value" of a single publication in a top journal[4] is highest in accounting. The authors estimate exchange rates, which account for the fact that it is more difficult to publish in a top accounting journal compared to other fields such as finance or marketing. For example, the authors find that a publication in a top accounting journal is roughly worth as much

[2] The authors focus on journals included in the ABDC Journal Quality list in general and on A-journals according to this list in particular. They approximate the opportunities to publish in (top) journals by the ratio of researchers per journal and the ratio of publications in top journals per researcher.

[3] Please note that the authors also document distinct differences regarding the average number of papers as well as the average number of papers per issue between accounting, finance, and management. For example, the average number of papers published in accounting journals between 2013 and 2014 was roughly 72, whereas finance (150) and management (180) journals published distinctly more papers in the same period on average The average number of papers per issue for the accounting journals in the sample of Grossmann et al. (2019) equals 7.69. This value is far below the average number of papers per issue for finance (12.98) respectively management (12.68) journals.

[4] The authors analyze journals included in the Chartered Association of Business Schools' Academic Journal Guide, 2015 and define top publications as journals in the category 4* according to this classification. Accounting journals included in the category 4* according to this classification are The Accounting Review (TAR), the journal Accounting, Organizations and Society (AOS), the Journal of Accounting Research (JAR), and the Journal of Accounting and Economics (JAE). According to the *JQL3*, TAR, JAR and JAE are A+ journals (top-tier journals) and AOS is an A journal (second-tier journals). With regard to management journals, the authors include the Academy of Management Journal (AMJ), the Academy of Management Review (AMR), the Administrative Science Quarterly (ASQ), the Journal of International Business Studies (JIBS), the Journal of Management (JOM), and the Strategic Management Journal (SMJ). According to the JQL3, these are all A respectively A+ journals.

as two publications in a top marketing journal.[5] Given this evidence, we expect to find that accounting professors publish less in highly ranked journals compared to professors in other fields.[6]

Fourth, we explore if fields of business administration differ with respect to aggregate measures of publication output, which might also be used by business administration faculties in order to allocate financial resources. Again, we rely on the *JQL3*, but also add international journal ratings such as the *SCImago Journal Rank (SJR)* (González-Pereira et al. 2010) and the *Source-Normalized Impact Factor (SNIP)* (Moed 2010).[7] According to the evidence on accounting professors provided above, we expect differences in aggregate measures of publication output as well. Hence, our fourth research question asks whether aggregate measures of publication output differ for accounting professors as opposed to the other fields of business administration.

With respect to the aspect of resource allocation within faculties, the last two research questions seem to be most relevant. Although explicit rules of resource allocation within the faculties are not publicly available, anecdotal evidence suggests that publications in the most prestigious journals as well as aggregate measures of research output based on journal ratings are important dimensions for resource allocation. In contrast, our first two research dimensions about national and practitioner foci of a field might not directly affect resource allocation, but indirectly yield lower scores in the third and fourth dimension, since publications for a German as well as for a practitioner audience do not count as highly rated publications according to our proxies of journal quality.

In order to answer our research questions, we draw on a unique, hand-collected dataset of 1,016 business administration professors in Germany, which we collected at the end of

[5] The authors derive this result by using publication data from leading journals in accounting, economics, finance, management, and marketing. Based on this data, they construct intradisciplinary author rankings, which they use to estimate the marginal effect of an additional publication on the ranking of each author within her own field.

[6] Admittedly, the results of previous literature that we cited in this paragraph could also be interpreted differently. Namely, one could also conclude that accounting researchers deliberately decide to refrain from publishing their work in such highly rated journals. In this context, we also want to stress that the derivation of our research question as well as our empirical strategy do not allow us to draw any causal conclusions, as our approach is purely explorative.

[7] For a brief but comprehensive description of the *SJR* and the *SNIP*, please refer to Sugimoto and Larivière (2018).

2018. We assign each professor one of seven disciplines[8], following Eisend and Schuchert-Güler (2015) who apply the fields in the journal *Business Research*, now *Schmalenbach Journal of Business Research*[9]. In addition, we collected information on the CVs of the professors, e.g., the year of tenure and the institution granting the PhD of the professor. We merge this dataset with publication data provided by the online research-monitoring portal *Forschungsmonitoring*, which results in 28,992 journal publications of the 1,016 business administration professors.[10][11]

We run a series of OLS regressions to test whether publication behavior between accounting professors and their peers in other business administration fields differs significantly from each other. Therefore, we use each of the publication behavior variables, e.g., the fraction of publications of a professor in practitioner's journals, as dependent variables. Concretely, we test whether accounting professors differ in the publication behavior variables, controlling for a battery of covariates like gender, the time to tenure and the year first tenure was received by the professor.

With respect to our research questions, we find strong differences regarding the focus on a national audience between the fields of business administration. While German accounting professors publish a large share of their work with German titles (66%), German operations professors only publish a quarter of their work with German titles. We document similar findings with respect to the share of publications in DACH region journals. In addition, we report differences regarding the focus on practitioner journals. Concretely, we document that accounting professors publish on average a large fraction (36%) of their papers in journals that do not primarily address a scientific audience. In contrast, operations professors publish only a small share (8%) of their work in such journals. The

[8] In particular, these seven disciplines are accounting, business information systems, finance, management, marketing, operations, and the residual category other.

[9] *Business Research* was the journal of the *German Academic Association for Business Research (VHB)*.

[10] More precisely, we restrict the data by *Forschungsmonitoring* on publications classified as "research articles" and additionally exclude conference presentations (i.e., publications in conference proceedings).

[11] The data by *Forschungsmonitoring* has been used frequently in recent research projects on German business administration and economics professors (e.g., Ayaita et al. (2019), Bäker et al. (2021)).

differences concerning a focus on a national audience as well as on practitioners' journals remain when controlling for a battery of covariates.

Furthermore, we document distinct differences regarding the publications in highly rated journals. We find that accounting professors have on average 0.85 publications in *FT50* journals, whereas marketing professors have 3.28 of these publications. When applying aggregate measures for the publication output of professors, we find that accounting professors – on average – accumulate the lowest score. In contrast, marketing and operations professors score highest with respect to aggregate measures. The differences, again, remain when controlling for a battery of control variables.

By providing empirical evidence that publication behavior in different fields of business administration differ, our paper offers several important implications. First and most importantly, our findings that accounting professors publish less in highly renowned international journals and have lower publication scores based on our aggregate measures contain implications concerning the performance-based resource allocation within business administration faculties (Hornbostel 2006; Sieweke et al. 2014). Our work suggests that researchers in accounting potentially might receive a rather low fraction of the allocated funds if existing journal ratings are applied naively. Hence, faculties should consider adjusting for differences in publication behavior before allocating resources within faculties when applying journal ratings. One approach could be to use exchange rates as proposed by Korkeamäki et al. (2018).

Second, as the acquisition of competitive third party funding often depends on the research output of professors (Grunig 1997), researchers in accounting might have less access to third party funding. Research foundations and other institutions have already identified this unintended implication as they ask for a more deliberate use of metrics to proxy for research quality. For example, the European Research Council (ERC) and the German Research Foundation (DFG) recently signed the San Francisco Declaration on Research Assessment (DORA), which argues against a use of journal-based metrics in

promotion, hiring, or funding decisions to asses an individual researcher's scientific contribution.[12]

This paper proceeds as follows. Section 2 describes our data and the applied methodology. Next, we present our results in Section 3. Section 4 provides additional evidence on the significance of behavioral differences in the field of accounting. Last, Section 5 discusses the results and implications.

2. Data and methodology

2.1 Sample and descriptive statistics

Our data collection process starts by identifying all German universities that have the right to grant doctorates and have a business administration and/or economics faculty. After having identified these universities, we browse the web pages of the universities at the end of 2018 and collect the names of all business administration professors (n = 1,116) at the respective business administration (or economics) faculties. Next, we gather CV information for each professor. For this purpose, we browse the CVs of the professors that are available online on the webpages of the universities or the personal webpages of the professors. We collect information (year and institution) regarding each career step (graduation, doctorate, habilitation, first tenured professorship) as well as demographic information (year of birth and gender) for each professor. For 70 professors we are not able to derive any information online, which restricts our sample to 1,046 individuals.

To examine publication behavior in different fields of business administration, we merge data regarding the publications of the professors in our sample with our initial CV dataset. The online research-monitoring portal *Forschungsmonitoring* provides us with this publication data. This publication data is of high quality, as *Forschungsmonitoring* not only retrieves information from publication databases but also asks researchers to correct

[12] Please refer to https://sfdora.org/read/ for more information regarding DORA.

and complement their publication records.[13] The publication data contains information about the title, year, journal, and coauthors of all publications for each researcher. While merging our hand-collected CV data with the publication data, we drop eight professors, as they are not included in the publication dataset. Furthermore, we restrict the *Forschungsmonitoring* data to publications classified as "research articles" as we only focus on journal publications and further exclude conference presentations and conference proceedings. Also, we omit professors without any publications which are classified as research articles. Thus, our final dataset consists of 28,992 publications written by 1,016 professors.

To assign each professor a field of business administration, we follow Eisend and Schuchert-Güler (2015), who use the fields in the journal *Business Research*, now *Schmalenbach Journal of Business Research*, as a classification scheme. According to the denomination of the respective professorship, we assign each professor to one of the following fields: accounting (n = 191), business information systems (n = 74), finance (n = 169), management (n = 265), marketing (n = 124), and operations (n = 137). We add a seventh category called other (n = 56) for those professors who do not fit in one of the above-listed categories.[14] Please note that we include financial accounting, managerial accounting and taxation professors in the accounting group. The operations group contains, according to the *Business Research* classification – besides operations professors – professors in the fields of entrepreneurship and innovation management, and thus is quite heterogeneous. The group of other professors largely consists of business education professors.[15]

[13] For a more detailed discussion regarding the *Forschungsmonitoring* data please refer to Hilber et al. (2021) and Sturm and Ursprung (2017).

[14] The group of other professors is the smallest group in our sample. Furthermore, it is rather heterogeneous regarding the background of the professors. Consequently, we refrain from interpreting the results for this group.

[15] To provide the reader with a better overview over the chairs included in each field of business administration, we conduct textual analysis on the denominations of the chairs. We report results in Appendix II-A.

Table II-1: Descriptive statistics

Variables	N	Mean	SD	5% Quantile	25% Quantile	50% Quantile	75% Quantile	95% Quantile
National Focus								
Share of Publications with German Title	1,016	0.40	0.32	0.00	0.12	0.35	0.67	0.97
Share of Publications in DACH Region Journals	1,016	0.49	0.33	0.00	0.21	0.50	0.78	1.00
Focus on Publications in Practitioner Journals								
Share of Publications in Practitioner Journals	1,016	0.18	0.21	0.00	0.00	0.11	0.30	0.63
Number of Publications in Highly Rated Journals								
FT50	1,016	1.73	3.90	0.00	0.00	0.00	2.00	8.00
JQL3 ≥A	1,016	3.77	6.28	0.00	0.00	1.00	5.00	15.00
JQL3 = A+	1,016	0.67	2.09	0.00	0.00	0.00	0.00	4.00
Holistic View on Publication Records								
JQL3 Score	1,016	2.37	2.44	0.13	0.83	1.70	3.06	7.01
SJR Score	1,016	1.39	1.71	0.06	0.34	0.87	1.87	4.01
SNIP Score	1,016	2.53	2.92	0.10	0.61	1.64	3.26	7.82
Control Variables								
Time to Tenure	903	6.72	2.76	3.00	5.00	6.00	8.00	12.00
Age Tenured Professorship	836	37.14	3.41	32.00	35.00	37.00	39.00	43.00
Years Tenured	942	11.80	7.32	1.00	6.00	11.00	17.00	25.00
Share of Female Professors	1,016	0.19	0.39	0.00	0.00	0.00	0.00	1.00
Number of Publications	1,016	32.40	36.14	3.75	12.00	21.00	40.00	98.50
Number of Different Coauthors	1,016	22.62	24.32	3.00	9.00	16.00	28.00	67.00

Notes: This table provides summary statistics regarding the publication behavior variables as well as the control variables used in the paper.

Table II-1 reports summary statistics on the variables derived from the professor's CVs that we use later in our regression analyses. E.g., the average time to tenure, i.e., the difference in years between the PhD and the first tenured professorship, is approximately seven years. The average age at which the professors in our data obtained their first tenured professorship is 37 years. On average, a professor in our sample has been tenured for roughly

12 years in 2018. Our sample includes 188 women, which equals approximately 19% of our sample.[16]

2.2 Publication behavior variables

To explore the publication behavior in different fields of business administration, we build on all publications of each professor as of the end of 2018 as provided by *Forschungsmonitoring*. Based on this data, we create a set of new variables. These variables help us to improve our understanding of differences in publication behavior of professors in several business administration fields.[17] In order to provide a better overview over our results, we cluster these variables into four dimensions according to our research questions.

First, we investigate the national focus of the German business administration professors. Therefore, we calculate the share of publications with a German title. To do so, we apply Google's Compact Language Detector 2 (Ooms 2018) on the titles of every publication. After having identified all publications with German titles, we compute for each professor in our data the fraction of publications with a German title. Next, we calculate for each field the mean of publications with a German title over all professors in the respective field. Second, we measure the share of publications in DACH region journals. To derive this variable, we process all journals included in our dataset by hand and tag those that originate from one of the three DACH countries.[18][19] Table II-1 shows that the professors in our data set publish on average about 40% of their publications with German titles and almost every second (49%) publication in a DACH region journal.

Second, we analyze the focus on practitioner journals. In order to do so, we follow Fülbier and Weller (2011) and make use of the journal rating *JQL3*. More precisely, we

[16] This value is comparable to recent findings by Hilber et al. (2021) who report a value of 20% female professors among economics professors in Austria, Germany, and Switzerland.

[17] Our level of analysis is the individual professors. Thus, we first calculate each publication behavior variable for every individual in our data. In a second step, we calculate average values for each field by estimating the mean values over all professors within one field.

[18] Please refer to Appendix II-B for a list with the most common DACH region journals in our dataset.

[19] Please note that we do not account for co-authorship in this analysis.

classify D journals according to the *JQL3* as well as journals where more than 50% of the respondents in the *JQL3* survey stated that the journal is not primarily a scientific journal as practitioner journals. After having identified all practitioner journals, we compute the fraction of publications in practitioner journals for each professor individually. Next, we calculate the mean over all professors in the respective field to derive the average share of publications in practitioner journals for each field. Professors in our sample publish on average 18% of their papers in practitioner journals according to Table II-1.

Third, we focus on three categories of publications in particularly prestigious journals. First, we focus on publications in journals included in the *FT50* list (Vidgen et al. 2019; Zhang 2021; Fassin 2021). In particular, we calculate the number of publications in such journals for each professor before calculating the averages for each field. On average, professors in our sample have 1.73 *FT50* publications. Second, we focus on publications in highly rated journals according to the *JQL3* (Eisend 2011; Schrader and Henning-Thurau 2009). This rating essentially assigns any journal one of six categories: A+, A, B, C, D, and "not ranked", with A+ being assigned to the journals with the highest attributed quality, i.e., the most prestigious journals. We focus on particularly highly rated journals and count the number of publications – not adjusted for the number of coauthors - in journals that are classified as A and A+, as well as the number of publications in journals that are classified A+.[20] Professors in our sample have 3.77 publications in journals classified at least as A and 0.67 publications in A+ journals on average.

Finally, we conduct a holistic evaluation of the professors' publication output. We again focus on the *JQL3*, as it is often applied in evaluation practice, as well as in research (see, e.g., Clermont (2016)). *Forschungsmonitoring* transforms the classification scheme of the *JQL3* (A+, A, B, C, D, not ranked) into respective points: 1.0, 0.5, 0.25, 0.1, 0.05, and 0.025. Based on these points, we calculate our variable as the sum of the weighted *JQL3* points of a professor from the beginning of her publishing career until the end of 2018:

[20] Please refer to Appendix II-C for a list of the *FT50* journals as well as for the lists with the journals that are classified as at least A respectively A+ journals according to the *JQL3*.

$$JQL3\ Score_i = \sum_{k=1}^{k=K} \frac{Points_k}{N_k} \quad \text{(II.1)}$$

The score for each professor i is calculated from $k = 1$, i.e., the first publication at the beginning of the respective (publishing) career until $k = K$, the last publication until the year 2018. $Points_k$ are the *JQL3* points of the journal in which publication k is published. We divide the *JQL3* points by N_k, the number of coauthors of publication k. We supplement this analysis by replacing the *JQL3* with two international journals ratings based on citations rather than expert judgements, the *SJR* (González-Pereira et al. 2010) and the *SNIP* (Moed 2010). More precisely, we replace the *JQL3* points by points assigned to the respective journal according to these two international measures, which can range between 0.025 and 1.0.[21] On average, a business administration professor has a *JQL3* Score of 2.37, which, e.g., translates into two single-authored publications in an A+ journal (e.g., *Journal of Finance* or *Academy of Management Journal*) and one A+ publication, which the professor has written with two coauthors.

2.3 Analytical strategy

In order to answer our research questions, we estimate a series of OLS regression models with the publication behavior variables being our dependent variables twice. In the first models, our independent variable of interest is a dummy variable that equals 1, if a professor is classified as an accounting professor. Consequently, we compare accounting professors with the aggregate of the remaining fields. In the second models, we include dummy variables for all fields except accounting. In this setting, we compare accounting professors with professors in each of the other fields separately.

In all regression models, we include a set of control variables that have been found to impact publication output in previous literature. First, we apply the time to tenure, i.e.,

[21] Please refer to Appendix II-D for a list of journals with the most points (1.0), i.e., the highest rated journals, according to the *SJR* and the *SNIP*.

the difference in years between obtaining the PhD and obtaining the first tenured professorship. Second, we include the age at which the professors obtained their first tenured professorship. Third, we control for the years since the professors in our data obtained their first professorship. The three variables account for changing publication output during the academic life cycle of individual researchers (see, e.g., Rauber and Ursprung (2008)) as well as for changing publication output over time in general (see, e.g., Ayaita et al. (2019)). The fourth control variable is the gender of the professors as previous literature documents gender differences with regard to publication output (see, e.g., Hilber et al. (2021), Jokinen and Pehkonen (2017), Madison and Fahlman (2020)). Fifth, we control for the total number of publications, as a proxy for the overall publication activity of the professors. Lastly, we control for the number of different coauthors a professor has collaborated with as prior literature shows a relationship between academic networks and research output (see, e.g., Ductor (2015), Li et al. (2013)).

3. Results

3.1 National focus

Descriptive evidence

Panel A of Table II-2 shows distinct differences between the business administration fields concerning the share of publications with German titles. While accounting professors publish 66.29% of their papers with a German title on average, professors in the remaining business administration fields typically publish less than 40% of their papers with German titles on average.

Panel B of Table II-2 shows a similar result concerning the share of publications in DACH region journals. Again, accounting professors on average publish most of their papers for a national audience (75.27%), whereas professors in the remaining business administration fields publish substantially less often (50% or lower) in such journals.

Table II-2: Descriptive statistics regarding the national focus and the focus on practitioner journals

PANEL A: Share of Publications with German Title	**N**	**Mean**	**Standard Deviation**
Accounting Professors	191	66.29%	28.70%
Business Information Systems Professors	74	31.87%	27.44%
Finance Professors	169	37.28%	31.60%
Management Professors	265	33.80%	28.46%
Marketing Professors	124	35.65%	27.47%
Operations Professors	137	25.29%	26.34%
Other Professors	56	42.52%	33.53%
PANEL B: Share of Publications in DACH Region Journals	**N**	**Mean**	**Standard Deviation**
Accounting Professors	191	75.27%	26.12%
Business Information Systems Professors	74	45.46%	28.97%
Finance Professors	169	48.22%	32.76%
Management Professors	265	42.33%	30.40%
Marketing Professors	124	43.30%	28.31%
Operations Professors	137	34.30%	29.22%
Other Professors	56	48.76%	34.16%
PANEL C: Share of Publications in Practitioner Journals	**N**	**Mean**	**Standard Deviation**
Accounting Professors	191	35.61%	24.00%
Business Information Systems Professors	74	13.02%	16.79%
Finance Professors	169	19.33%	21.97%
Management Professors	265	13.08%	17.94%
Marketing Professors	124	17.76%	16.30%
Operations Professors	137	8.37%	11.19%
Other Professors	56	11.53%	19.51%

Notes: This table reports descriptive statistics regarding the national focus and the focus on practitioner journals for the professors in different business administration fields. Panel A shows the average share of publications with German titles. Panel B shows the average share of publications in DACH region journals. Panel C shows the average share of publications in practitioner journals.

Regression results

Columns (1) to (4) of Table II-3 present our regression results with regard to the national focus of the professors. In column (1), we report a statistically significant difference between accounting professors and their peers in the remaining fields concerning the share of publications with German titles. The size of the coefficient equals 0.2859

(p-value = 0.0000), which is economically meaningful given that the average share of publications with German titles of all professors in our regression sample equals 41.91%.

Column (2) displays the results with accounting professors as the reference group, i.e., accounting professors are compared with each other field individually. The difference regarding the share of publications with German titles between accounting professors and professors in each other field is statistically significant for all comparisons. Our model indicates that the largest difference exists between operations and accounting professors (-0.3656, p-value = 0.0000), whereas the smallest difference exists between business information systems and accounting professors (-0.2527, p-value = 0.0000).

Column (3) reports the difference between accounting professors and all remaining fields concerning the share of publications in DACH region journals. Again, the difference is highly significant. The coefficient equals 0.2889 (p-value = 0.0000), which we consider economically meaningful in light of the average share of publications in DACH region journals of 51.26% in our regression sample.

Column (4) displays findings for the comparison of accounting professors to each remaining field separately. Similar to our results with respect to the share of publications with German titles, we find statistically significant differences between accounting professors and professors in each other field regarding the share of publications in DACH region journals. Again, the difference is largest when we compare operations and accounting professors (-0.3700, p-value = 0.0000) and smallest when we compare accounting and business information systems professors (-0.2100, p-value = 0.0000). Taken together, these results underline that accounting professors possess a stronger national focus when publishing their academic work compared to their peers in the other business administration fields.

Table II-3: OLS regressions on national focus and focus on practitioner journals

Dependent variable:	**Share of Publications with German Title**		**Share of Publications in DACH Region Journals**		**Share of Publications in Practitioner Journals**	
Mean LHS	0.4191	0.4191	0.5126	0.5126	0.1950	0.1950
	(1)	(2)	(3)	(4)	(5)	(6)
Accounting Professors	0.2859***		0.2889***		0.1814***	
	(0.0213)		(0.0202)		(0.0178)	
Business Information Systems Professors		-0.2527***		-0.2100***		-0.1641***
		(0.0359)		(0.0387)		(0.0277)
Finance Professors		-0.2829***		-0.2650***		-0.1393***
		(0.0289)		(0.0285)		(0.0244)
Management Professors		-0.2770***		-0.2868***		-0.1956***
		(0.0245)		(0.0241)		(0.0198)
Marketing Professors		-0.2677***		-0.2914***		-0.1512***
		(0.0293)		(0.0278)		(0.0216)
Operations Professors		-0.3656***		-0.3700***		-0.2336***
		(0.0282)		(0.0286)		(0.0197)
Other Professors		-0.1820***		-0.2244***		-0.1981***
		(0.0623)		(0.0542)		(0.0435)
Time to Tenure	0.0064	0.0065	0.0057	0.0057	0.0029	0.0035
	(0.0046)	(0.0046)	(0.0047)	(0.0047)	(0.0038)	(0.0038)
Age Tenured Professorship	0.0087**	0.0078**	0.0078**	0.0071*	0.0050*	0.0051*
	(0.0038)	(0.0037)	(0.0037)	(0.0036)	(0.0028)	(0.0028)
Years Tenured	0.0206***	0.0203***	0.0206***	0.0203***	0.0094***	0.0090***
	(0.0012)	(0.0012)	(0.0012)	(0.0012)	(0.0010)	(0.0010)
Female	-0.0179	-0.0172	-0.0113	-0.0062	-0.0200	-0.0150
	(0.0218)	(0.0220)	(0.0233)	(0.0234)	(0.0173)	(0.0171)
Number of Publications	0.0008**	0.0008**	0.0006*	0.0007**	0.0012***	0.0012***
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0002)	(0.0002)
Number of Different Coauthors	-0.0026***	-0.0027***	-0.0025***	-0.0027***	-0.0020***	-0.0020***
	(0.0005)	(0.0006)	(0.0005)	(0.0005)	(0.0003)	(0.0003)
Constant	-0.2202*	0.1031	-0.0847	0.2313*	-0.1563*	0.0242
	(0.1231)	(0.1233)	(0.1224)	(0.1223)	(0.0905)	(0.0889)
Observations	807	807	807	807	807	807
R^2	0.4474	0.4621	0.4326	0.4490	0.3258	0.3444
Adjusted R^2	0.4426	0.4540	0.4276	0.4407	0.3198	0.3345
F Statistic	92.4181***	56.8450***	87.0258***	53.9171***	55.1472***	34.7622***

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Table II-3 continued from previous page

Notes: This table displays results obtained from six OLS regressions on three different dependent variables. The unit of observation is the individual professor. First, in the first two columns the dependent variable is the share of publications with German titles for each professor. Second, in the third and fourth column, the dependent variable is the share of publications in DACH region journals for each professor. Third, in the fifth and sixth column, the dependent variable is the share of publications in practitioner journals for each professor. The variables of interest are field dummies according to the field in which a certain professor operates. In the first specification of each dependent variable, we first include a dummy variable that equals 1, if a professor is classified an *accounting* professor and zero otherwise. In the second specification of each dependent variable, we include a set of field dummies where *accounting* is the reference category. We display heteroscedasticity robust standard errors in the parentheses. Significance levels are denoted as follows: *p<0.1; **p<0.05; ***p<0.01

3.2 Focus on practitioner journals

Descriptive evidence

Panel C of Table II-2 shows the average share of publications in practitioner journals of the professors in each business administration field. Accounting professors publish on average 35.61% of their papers in such journals, which is the highest fraction among all business administration fields. In contrast, business administration professors in the remaining fields publish on average less than 20% of their papers in practitioner journals.

Regression results

Column (5) of Table II-3 presents our results with respect to the difference in the share of publications in practitioner journals between accounting professors and their peers in other fields. According to our model, this difference accounts for 0.1814 and is statistically significant (p-value = 0.0000). Given the size of the coefficient, we consider this difference economically relevant, as the average share of publications in practitioner journals equals 19.50% in our regression sample.

Column (6) shows the results where we compare accounting professors with the remaining business administration fields separately. We find significant differences for all fields. Again, the largest difference exists between operations and accounting professors (-0.2336, p-value = 0.0000). The smallest difference exists between finance and accounting professors (-0.1393, p-value = 0.0000). Overall, the regression results show that accounting

professors rely more heavily on publications in practitioner journals compared to professors in other business administration fields.

3.3 Focus on highly rated journals

Descriptive evidence

Panel A of Table II-4 presents the average number of publications – not adjusted for co-authorship – in *FT50* journals of the professors in each field. We find that marketing professors in our sample have 3.28 *FT50* publications on average, which is the highest value among all fields. In contrast, accounting (0.85) and business information systems professors (0.82) have the lowest average number of *FT50* publications. Professors in the remaining fields have between 1.44 (finance) and 2.25 (operations) *FT50* publications on average.

Panel B of Table II-4 shows the average number of publications in journals that have at least an A rating according to the *JQL3*. In contrast to the list of *FT50* journals, more than 90 journals fulfill this criterion. Given that there are distinctly more A journals according to the *JQL3* than journals in the *FT50* list, we find higher average values in Panel B compared to Panel A. Operations (6.04) and marketing (5.81) professors publish the most publications on average in such journals. By quite some margin, accounting professors have the fewest publications on average in at least A-rated journals (1.81). Professors in the remaining fields on average have between 3.5 and 4 of these publications.

Panel C of Table II-4 displays the average number of publications in A+ journals according to the *JQL3*. The *JQL3* classifies 22 journals as A+ journals. With the only exception of the journal *Science*, all A+ journals are also included in the *FT50* list. As there are only few A+ journals according to the *JQL3*, we find comparatively low averages in Panel C. Again, we find that marketing professors have the highest average number of such publications (1.89), whereas accounting (0.38) and business information systems professors (0.39) have the lowest average number of A+ publications.

Table II-4: Descriptive statistics regarding publications in highly rated journals and the holistic view on publication records

PANEL A: FT50	**N**	**Mean**	**Standard Deviation**
Accounting Professors	191	0.85	3.01
Business Information Systems Professors	74	0.82	1.67
Finance Professors	169	1.44	2.60
Management Professors	265	2.05	3.49
Marketing Professors	124	3.28	6.89
Operations Professors	137	2.25	4.32
Other Professors	56	0.59	1.45
PANEL B: JQL3 ≥A	**N**	**Mean**	**Standard Deviation**
Accounting Professors	191	1.81	3.75
Business Information Systems Professors	74	3.72	5.20
Finance Professors	169	3.77	4.50
Management Professors	265	3.62	6.42
Marketing Professors	124	5.81	9.06
Operations Professors	137	6.04	7.81
Other Professors	56	1.25	2.79
PANEL C: JQL3 = A+	**N**	**Mean**	**Standard Deviation**
Accounting Professors	191	0.38	1.89
Business Information Systems Professors	74	0.39	1.08
Finance Professors	169	0.80	1.86
Management Professors	265	0.51	1.54
Marketing Professors	124	1.89	4.09
Operations Professors	137	0.45	1.05
Other Professors	56	0.27	0.84
PANEL D: JQL3 Score	**N**	**Mean**	**Standard Deviation**
Accounting Professors	191	2.11	2.01
Business Information Systems Professors	74	2.32	2.63
Finance Professors	169	2.43	2.15
Management Professors	265	2.34	2.20
Marketing Professors	124	3.05	3.56
Operations Professors	137	2.73	2.49
Other Professors	56	0.91	1.45

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Table II-4 continued from previous page

PANEL E: SJR Score	**N**	**Mean**	**Standard Deviation**
Accounting Professors	191	0.82	1.19
Business Information Systems Professors	74	1.18	1.38
Finance Professors	169	1.44	1.95
Management Professors	265	1.51	1.53
Marketing Professors	124	1.90	2.36
Operations Professors	137	1.80	1.80
Other Professors	56	0.69	0.92
PANEL F: SNIP Score	**N**	**Mean**	**Standard Deviation**
Accounting Professors	191	1.37	1.66
Business Information Systems Professors	74	3.10	3.46
Finance Professors	169	2.37	2.62
Management Professors	265	2.77	2.83
Marketing Professors	124	3.15	3.64
Operations Professors	137	3.50	3.50
Other Professors	56	1.27	1.60

Notes: This table reports descriptive statistics regarding the focus on publications in highly rated journals and the holistic view on all publications for the professors in different business administration fields. Panel A shows the average number of publications in *FT50* journals. Panel B shows the average number of publications in journals that are ranked at least as A journals according to the *JQL3*. Panel C shows the average number of A+ journals according to the *JQL3*. Panel D shows the average *JQL3* Scores. Panel E shows the average *SJR* Scores. Panel F shows the average *SNIP* Scores.

Regression results

Columns (1) to (6) of Table II-5 report our regression results regarding the focus on publications in highly rated journals. Column (1) confirms that accounting professors publish significantly less in *FT50* journals. The difference between accounting and the other professors accounts for -0.9394 (p-value = 0.0059). This difference is also economically meaningful given that the average in our dataset accounts to 1.70. In column (2), we compare accounting professors with the remaining fields separately and find significant differences compared to business information systems, management, marketing, and operations professors. The largest difference exists between accounting and marketing professors (2.2963, p-value = 0.0000). In contrast, we find no significant difference between accounting and finance professors regarding the number of publications in *FT50* journals.

Table II-5: OLS regressions on publications in highly rated journals and on the holistic view on publication records

Dependent variable:	FT50		JQL3 ≥ A		JQL3 = A+		JQL3 Score		SJR Score		SNIP Score	
Mean LHS	1.6952	1.6952	3.8315	3.8315	0.6221	0.6221	2.4754	2.4754	1.4275	1.4275	2.6297	2.6297
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Accounting Professors	-0.9394***		-2.1349***		-0.3123*		-0.4268***		-0.7545***		-1.4694***	
	(0.3122)		(0.4478)		(0.1843)		(0.1524)		(0.1257)		(0.1840)	
Business Information Systems Professors		-0.7463*		-0.1710		-0.2255		-0.3744		-0.0399		0.7276**
		(0.3849)		(0.5997)		(0.2151)		(0.2854)		(0.1841)		(0.3447)
Finance Professors		0.5109		1.8816***		0.3741		0.4748**		0.7384***		1.2250***
		(0.3710)		(0.5459)		(0.2422)		(0.1921)		(0.2188)		(0.2694)
Management Professors		0.8587***		1.4833**		0.0210		0.3773**		0.7404***		1.4917***
		(0.3092)		(0.5854)		(0.1663)		(0.1657)		(0.1289)		(0.2113)
Marketing Professors		2.2963***		3.4152***		1.4925***		0.5778**		0.9344***		1.4167***
		(0.7798)		(0.9327)		(0.4685)		(0.2912)		(0.2280)		(0.3200)
Operations Professors		1.3345***		4.0713***		0.0841		0.8711***		1.0923***		2.2610***
		(0.4770)		(0.7295)		(0.1829)		(0.2170)		(0.1695)		(0.2975)
Other Professors		0.1752		0.2357		-0.0066		-0.3186		0.3161**		0.7980***
		(0.4083)		(0.5647)		(0.2077)		(0.2140)		(0.1502)		(0.2302)
Time to Tenure	0.1027	0.1197	0.0787	0.1013	0.0695	0.0891*	0.0419	0.0421	0.0435	0.0435	0.0435	0.0413
	(0.0826)	(0.0866)	(0.1291)	(0.1320)	(0.0481)	(0.0498)	(0.0419)	(0.0423)	(0.0333)	(0.0333)	(0.0505)	(0.0501)
Age Tenured Professorship	-0.1955***	-0.1951***	-0.3180***	-0.3022***	-0.1144***	-0.1168***	-0.1084***	-0.1010***	-0.0778***	-0.0729***	-0.1151***	-0.1086***
	(0.0643)	(0.0651)	(0.0997)	(0.0983)	(0.0370)	(0.0367)	(0.0335)	(0.0331)	(0.0269)	(0.0262)	(0.0416)	(0.0403)

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Table II-5 continued from previous page

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Years Tenured	-0.0722***	-0.0700***	-0.1328***	-0.1275***	-0.0191**	-0.0212**	-0.0179*	-0.0171*	-0.0367***	-0.0359***	-0.0889***	-0.0853***
	(0.0163)	(0.0163)	(0.0282)	(0.0281)	(0.0081)	(0.0085)	(0.0098)	(0.0097)	(0.0070)	(0.0071)	(0.0119)	(0.0118)
Female	-0.4728*	-0.5963**	-1.3633***	-1.4113***	-0.3974***	-0.3964***	-0.3743***	-0.4064***	-0.3515***	-0.3909***	-0.5201***	-0.5763***
	(0.2434)	(0.2450)	(0.3973)	(0.3985)	(0.1080)	(0.1068)	(0.1185)	(0.1193)	(0.0892)	(0.0870)	(0.1561)	(0.1583)
Number Publications	0.0086	0.0065	0.0161	0.0139	0.0030	0.0023	0.0336***	0.0325***	0.0174**	0.0163**	0.0289**	0.0281**
	(0.0116)	(0.0112)	(0.0180)	(0.0175)	(0.0064)	(0.0062)	(0.0119)	(0.0118)	(0.0070)	(0.0068)	(0.0121)	(0.0122)
Number Different Coauthors	0.0289**	0.0324***	0.0767***	0.0812***	0.0101*	0.0111**	0.0203	0.0223*	0.0132*	0.0153**	0.0360***	0.0376***
	(0.0117)	(0.0121)	(0.0188)	(0.0187)	(0.0052)	(0.0049)	(0.0125)	(0.0128)	(0.0073)	(0.0074)	(0.0135)	(0.0141)
Constant	8.4310***	7.3679***	15.0062***	12.0737***	4.4244***	4.1097***	4.9331***	4.2243***	3.7688***	2.8271***	6.2202***	4.4840***
	(1.8840)	(1.8989)	(2.9716)	(2.9447)	(1.0545)	(1.0404)	(1.0018)	(0.9952)	(0.8115)	(0.7906)	(1.2893)	(1.2492)
Observations	807	807	807	807	807	807	807	807	807	807	807	807
R^2	0.0978	0.1290	0.2045	0.2371	0.0580	0.1072	0.4898	0.5060	0.3036	0.3263	0.4271	0.4442
Adjusted R^2	0.0899	0.1159	0.1975	0.2256	0.0498	0.0937	0.4853	0.4985	0.2975	0.3162	0.4221	0.4358
F Statistic	12.3791***	9.8039***	29.3425***	20.5685***	7.0331***	7.9475***	109.5811***	67.7641***	49.7522***	32.0532***	85.0972***	52.8715***

Notes: This table displays results obtained from twelve OLS regressions on six different dependent variables. The unit of observation is the individual professor. First, in the first two columns the dependent variable is the number of publications in *FT50* journals. Second, in the third and fourth column, the dependent variable is the number of publications in journals that are at least rated A according to the *JQL3*. Third in the fifth and sixth column, the dependent variable is the number of publications A+ journals according to the *JQL3*. The dependent variables in columns (7) to (12) are the three variables that capture the holistic publication records measured by the *JQL3* Score, the *SJR* Score, and the *SNIP* Score. The variables of interest are field dummies according to the field in which a certain professor operates. In the first specification of each dependent variable, we first include a dummy variable that equals 1, if a professor is classified an *accounting* professor and zero otherwise. In the second specification of each dependent variable, we include a set of field dummies where *accounting* is the reference category. We display heteroscedasticity robust standard errors in the parentheses. Significance levels are denoted as follows: *p<0.1; **p<0.05; ***p<0.01

Column (3) presents our results regarding the difference between accounting professors and those in other fields with respect to publications in journals that have at least an A rating according to the *JQL3*. The regression model shows that accounting professors publish 2.1349 papers less in such journals in comparison to professors in the other fields. This difference is statistically significant (p-value = 0.0000) and, again, economically relevant as well. We focus on the differences between accounting professors and their peers in the remaining fields separately in column (4). We find that finance, management, marketing and operations professors have significantly more publications in such journals compared to accounting professors. In contrast, regression results show no significant difference between accounting and business information systems professors.

Column (5) reports the results from the regression model, where we compare accounting professors to those in other fields regarding the number of publications in A+ journals. Our regression result reveals that accounting professors have significantly less publications in such journals compared to their peers in other fields. In particular, this difference accounts for -0.3123 (p-value = 0.0901), which is economically meaningful given that the average number of publications in A+ journals in our regression sample equals 0.62. Column (6) shows that this difference between accounting professors and their peers in other fields is largely triggered by the marketing professors. Marketing professors publish 1.4925 more papers in A+ journals compared to accounting professors, which is statistically significant (p-value = 0.0000). In contrast, the differences between accounting professors and professors in business information systems, finance, management, or operations are not statistically significant.

3.4 Holistic view on all journal publications

Descriptive evidence

Panel D of Table II-4 presents descriptive evidence concerning the *JQL3* Score of the professors in the different business administration fields. We find that marketing professors have the highest average *JQL3* Score among all business administration fields (3.05). Even

though accounting professors have the lowest average score (2.11), the value is relatively close to the averages of the professors in the other fields (e.g., finance professors have an average score of 2.43).

Both international measures for journal quality also document that accounting professors have the lowest scores. Panel E shows that accounting professors have an average *SJR* Score of 0.82, whereas marketing professors have the highest scores (1.90). Panel F shows that accounting professors have the lowest *SNIP* Score of 1.37 compared to the highest scoring field in this dimension, operations (3.50).

Regression results

Columns (7) and (8) of Table II-5 show our regression results with regard to the *JQL3* Score. In column (7) we find that the holistic publication record as measured by this score is significantly lower for accounting professors in comparison to the other business administration fields. More precisely, the difference accounts to -0.4268 (p-value = 0.0069), which is roughly 17% of the average score of our regression sample. Column (8) presents differences between accounting professors and their peers in the other fields separately. The regression model shows no significant difference between business information systems and accounting professors. Yet, professors in the remaining fields finance, management, marketing, and operations have significantly higher scores than accounting professors.

Both of our international measures, the *SJR* and the *SNIP* Score, corroborate our findings with respect to the *JQL3* Score. Column (9) documents a statistically significant and economically relevant (-0.7545, p-value = 0.0000) difference between accounting professors and their peers in the other fields. This difference accounts for roughly 53% of the average score of our regression sample. Our regression model in column (11) displays that accounting professors have significantly lower *SNIP* Scores compared to their peers in the other fields. The size of the coefficient equals -1.4694 (p-value = 0.0000), which again is economically relevant (56% of the average score of our regression sample) as well.

4. Further analyses

4.1 Decomposing the behavioral differences

To explain the documented gap in publication behavior between accounting professors and those in other fields, we decompose the difference between these two groups using a Blinder-Oaxaca counterfactual decomposition (Blinder 1973; Oaxaca 1973), which typically has been employed to explain gender differences in outcome variables (see, e.g., Bannier et al. (2019)). In our study, we apply a twofold counterfactual decomposition of the following form:

$$\overline{Y_R} - \overline{Y_A} = \underbrace{\overbrace{(\overline{X_R} - \overline{X_A})'}^{(I)}\beta^*}_{explained} + \underbrace{\overbrace{\overline{X}_R'(\beta_R - \beta^*)}^{(II)} + \overbrace{\overline{X}_A'(\beta^* - \beta_A)}^{(III)}}_{unexplained} \quad \text{(II.2)}$$

Here, $\overline{Y_R} - \overline{Y_A}$ denotes the outcome differential in our publication behavior variables between professors in the remaining fields (R) and accounting professors (A), and X is a vector capturing individual characteristics as well as a constant. β^* denotes a coefficient vector estimated from a pooled regression over the two groups, and β_R and β_A are the coefficients derived from separately regressing the publication behavior variables on the individual characteristics of accounting professors and those in the remaining fields. The twofold decomposition divides the differences with respect to the publication behavior variables between accounting professors and those in the remaining fields into two parts. The first part is the part that can be explained by differences in group characteristics based on our control variables, i.e., the same variables that we use in the OLS regressions. The second part is the part that cannot be explained by differences in these group characteristics, and hence is called the unexplained part. In our setting, this part is the part capturing behavioral differences between accounting professors and professors in the remaining business administration fields.

Table II-6: Blinder-Oaxaca decomposition

Dependent variables:	**Share of Publications with German Title**	**Share of Publications in DACH Region Journals**	**Share of Publications in Practitioner Journals**	**FT50**	**JQL3 ≥ A**	**JQL3 = A+**	**JQL3 Score**	**SJR Score**	**SNIP Score**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Number of accounting professors	168	168	168	168	168	168	168	168	168
Number of professors in other fields	639	639	639	639	639	639	639	639	639
Pooled number of observations	807	807	807	807	807	807	807	807	807
Mean accounting professors	0.6735	0.7676	0.3595	0.8393	1.8452	0.3452	2.2187	0.8487	1.4173
Mean professors in other fields	0.3522	0.4456	0.1518	1.9202	4.3537	0.6948	2.5429	1.5797	2.9484
Observed difference	0.3213	0.3220	0.2077	-1.0809	-2.5084	-0.3496	-0.3243	-0.7310	-1.5310
Explained effect	0.0354**	0.0332**	0.0263***	-0.1415	-0.3736	-0.0373	0.1025	0.0236	-0.0616
	(0.0148)	(0.0147)	(0.0081)	(0.1367)	(0.2356)	(0.0706)	(0.1537)	(0.0855)	(0.1599)
Unexplained effect	0.2858***	0.2889***	0.1814***	-0.9394***	-2.1349***	-0.3123*	-0.4268***	-0.7545***	-1.4694***
	(0.0211)	(0.0195)	(0.0184)	(0.3294)	(0.4475)	(0.1828)	(0.1506)	(0.1273)	(0.1870)

Notes: This table displays the results of a Blinder-Oaxaca decomposition, which was estimated using the same control variables as in our OLS regressions in Table II-3 and Table II-5. Standard errors in parentheses. Significance levels are denoted as follows: *p<0.1; **p<0.05; ***p<0.01

Table II-6 reports the results applying the nine publication behavior variables. In each model, we control for the same set of control variables that we used in our OLS regressions in the previous section. Our results show that the coefficients of the unexplained parts are statistically significant in all models, while the coefficients of the explained parts are not always significant. Additionally, the fraction of the explained respectively the unexplained effects differ substantially. For example, in column (1) the observed difference between accounting and non-accounting professors regarding the share of publications with a German title accounts for 0.3213. Our decomposition approach splits this difference into an explained effect of 0.0354 (11.02%) and an unexplained effect of 0.2858 (88.98%). We observe similar patterns for the remaining variables as well. For instance, the observed difference in the share of publications in practitioner journals between accounting and non-accounting professors equals 0.2077. This difference is decomposed into an explained part of 0.0263 (12.66%) and an unexplained part of 0.1814 (87.34%). Taken together, our decomposition results show that the part of the observed difference that can be explained by differences in characteristics between accounting and non-accounting professors is rather small compared to the unexplained part. Thus, this finding strengthens our argument that we actually observe behavioral differences between accounting professors and their peers in other business administration fields.

4.2 Publication Training

An alternative explanation for our results might be that accounting professors differ from those in other fields of business administration in that they receive less training on how to publish internationally or in particularly highly rated journals. Researchers could receive such training through two potential channels. First, they could receive formal training on how to publish in renowned international journals by attending specific PhD courses on this issue. Second, they could receive informal training through their academic networks. Unfortunately, we lack data on PhD courses attended by the professors in our data.

Additionally, a large fraction of professors in our data did not participate in a formal PhD program.

In order to investigate the second channel, however, we conduct a series of additional regression analyses in which we use a proxy for informal training. In particular, we create the dummy variable *International Visit* that equals 1, if professors mentions at least one international visit (e.g., a research visit) in their CVs. Such visits might help to establish international networks or receive additional input on how to publish successfully internationally. 58.12% of the accounting professors in our data mention at least one of these international visits, which is below the fraction of professors in the remaining fields (65.09%). This difference is statistically significant on the 10%-level ($\chi^2 = 2.97$). Given that accounting professors differ significantly from those in the remaining fields regarding this publication training proxy, it could be possible that this proxy helps to explain why accounting professors are different compared to their peers with respect to the publication behavior variables.

In order to determine whether this holds true, we estimate a series of additional OLS regressions. In a first step, we include the dummy variable *International Visit* as an additional control variable in the models that we discussed in Section 3. Panel A of Table II-7 presents the respective results, which highlight two aspects. First, we document that our publication training proxy is significantly related to several of the dependent variables. More precisely, the regression results show that professors who mention an international visit in their CVs tend to publish less of their papers with German titles or in DACH region journals. Additionally, these professors publish a lower fraction of their papers in practitioner journals. Furthermore, we find that professors with an international visit in their CV have higher scores with respect to their holistic publication records. Second, our results show that although we control for the publication training proxy, our results regarding the difference between accounting professors and their peers in other fields remain robust. So, we still document a stronger national focus, a stronger focus on practitioner journals, a lower number of publications in highly renowned journals, and lower scores

regarding the holistic publication records. The magnitude of the coefficients of the accounting dummy decreases only marginally.

In a second step, we analyze whether accounting professors who received publication training according to our proxy act differently compared to accounting professors who did not receive such training. In order to address this research question, we estimate a series of OLS regressions in which we include the following variables. First, a dummy variable *Non-Accounting Professors* that equals 1, if a professor is not classified as an accounting professor. Second, a dummy variable that equals 1, if a professor received publication training as measured by our proxy. Third, an interaction term between both dummy variables. In addition, we include our set of control variables that we utilized in our earlier regression models as well.

Table II-7: Publication training

Panel A: Without Interaction Term	**Share of Publications with German Title**	**Share of Publications in DACH Region Journals**	**Share of Publications in Practitioner Journals**	**FT50**	**JQL3 ≥ A**	**JQL3 = A+**	**JQL3 Score**	**SJR Score**	**SNIP Score**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Accounting Professors	0.2833***	0.2864***	0.1798***	-0.9290***	-2.1291***	-0.3079*	-0.4206***	-0.7476***	-1.4597***
	(0.0206)	(0.0198)	(0.0173)	(0.3145)	(0.4520)	(0.1859)	(0.1523)	(0.1256)	(0.1835)
International Visit	-0.1326***	-0.1281***	-0.0839***	0.5285	0.2960	0.2280	0.3191**	0.3515***	0.4967***
	(0.0192)	(0.0192)	(0.0147)	(0.3521)	(0.5166)	(0.1812)	(0.1477)	(0.1224)	(0.1895)
Constant	-0.0188	0.1099	-0.0289	7.6283***	14.5566***	4.0780***	4.4484***	3.2349***	5.4658***
	(0.1239)	(0.1239)	(0.0906)	(2.0217)	(3.0196)	(1.1342)	(1.0281)	(0.8050)	(1.3086)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	807	807	807	807	807	807	807	807	807
R^2	0.4840	0.4664	0.3577	0.1014	0.2049	0.0604	0.4932	0.3114	0.4327
Adjusted R^2	0.4789	0.4610	0.3513	0.0924	0.1970	0.0510	0.4881	0.3045	0.4270
F Statistic	93.5800***	87.1824***	55.5607***	11.2513***	25.7096***	6.4100***	97.0718***	45.1099***	76.0689***

Continued on next page

Table II-7 continued from previous page

Panel B: With Interaction Term	**Share of Publications with German Title**	**Share of Publications in DACH Region Journals**	**Share of Publications in Practitioner Journals**	**FT50**	**JQL3 ≥ A**	**JQL3 = A+**	**JQL3 Score**	**SJR Score**	**SNIP Score**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Non-Accounting Professors	-0.2749***	-0.2420***	-0.2166***	1.0942**	2.3730***	0.4711*	0.6500***	0.7049***	1.4718***
	(0.0307)	(0.0265)	(0.0317)	(0.4685)	(0.7692)	(0.2603)	(0.2199)	(0.1579)	(0.2680)
International Visit	-0.1219***	-0.0717**	-0.1307***	0.7387	0.6065	0.4358	0.6111**	0.2971	0.5121*
	(0.0362)	(0.0327)	(0.0342)	(0.5049)	(0.6860)	(0.3036)	(0.2564)	(0.1980)	(0.2924)
Non-Accounting Professors x International Visit	-0.0135	-0.0713*	0.0592	-0.2655	-0.3922	-0.2624	-0.3688	0.0687	-0.0195
	(0.0399)	(0.0368)	(0.0366)	(0.6407)	(0.9189)	(0.3706)	(0.3025)	(0.2284)	(0.3505)
Constant	0.2552**	0.3474***	0.1914**	6.5174***	12.1588***	3.5904***	3.7752***	2.5343***	3.9927***
	(0.1251)	(0.1248)	(0.0934)	(1.8218)	(2.9645)	(0.9923)	(1.0008)	(0.7727)	(1.2948)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	807	807	807	807	807	807	807	807	807
R^2	0.4841	0.4684	0.3607	0.1015	0.2051	0.0610	0.4940	0.3115	0.4327
Adjusted R^2	0.4783	0.4623	0.3535	0.0914	0.1961	0.0504	0.4883	0.3037	0.4262
F Statistic	83.1018***	78.0124***	49.9724***	10.0069***	22.8440***	5.7491***	86.4723***	40.0579***	67.5325***

Notes: This table displays results obtained from a series of OLS regressions. The unit of observation is the individual professor. In Panel A, we interact the Accounting dummy with a dummy variable that equals 1, if a professor notes an international visit in her CV. In Panel B, we interact the Non-Accounting Professor dummy with a dummy variable that equals 1, if a professor lists at least one international visit in the CV (e.g., a research stay). In all models, we control for the time to tenure, the age when the professor obtained the first tenured professorship, the years since the professor obtained the first tenured professorship, a dummy variable for the gender of the professor, the number of publications that a professor has published as well as the number of different coauthors of a professor. We display heteroscedasticity robust standard errors in the parentheses. Significance levels are denoted as follows: *p<0.1; **p<0.05; ***p<0.01

Panel B of Table II-7 presents the results. We document significant differences between non-accounting professors and accounting professors who both did not receive publication training in terms of our dependent variables as indicated by the coefficient of the non-accounting dummy. These findings are consistent with our previous findings. With respect to the publication training effect for accounting professors, we find that accounting professors with publication training publish with a lower national focus and focus less on practitioner journals when compared to their peers who did not receive this training. Furthermore, we document that the accounting professors who received this training have higher publication scores as measured by the *JQL3* Score and the *SNIP* Score. We derive these results from the coefficient of the dummy variable *International Visit*. Lastly, our regression models yield insignificant coefficients regarding the interaction term. This result suggests that we do not find a significant difference in the extent to which international visits affect the publications of accounting and non-accounting professors.

4.3 Accounting sub-fields

Given that our results indicate that publication records of accounting professors differ from publication records of their peers in many ways, we provide a more in-depth analysis of the accounting professors. To do so, we assign accounting professors to one of the three groups financial accounting, managerial accounting, and taxation according to the denomination of their chairs. For professors, where a unique assignment was not possible (n = 47), we applied a Bayesian learning algorithm to provide a unique assignment.[22] This process yields in 76 financial accounting, 69 managerial accounting, and 49 taxation professors.

Panel A of Table II-8 displays our results regarding the national focus of the accounting sub-fields. Panel A shows that taxation professors (78.70%) publish the highest share of

[22] In particular, we used the professors where a unique assignment was possible as our training data set. Based on this training data set, the algorithm then predicted the group (financial accounting, managerial accounting, and taxation) for the professors where a unique assignment was initially impossible.

their papers with German titles. This value is distinctly higher, than the averages for financial accounting (67.51%) and managerial accounting (56.34%) professors. The same pattern persists when analyzing the share of publications in DACH region journals. Taxation professors publish 84.75% of their papers in DACH region journals, which is a distinctly higher percentage than financial accounting (75.91%) and managerial accounting (67.99%) professors.

Panel C of Table II-8 shows the results of our analysis regarding the focus on publications in practitioner journals. We find that taxation professors in our sample publish 41.70% of their papers in such journals, which is the highest fraction among the accounting sub-fields and significantly more compared to the mean of the remaining accounting sub-fields financial accounting (35.18%) and managerial accounting (31.84%) (p-value = 0.0776).

Panels D to F of Table II-8 present results concerning the focus on top publications in the accounting sub-fields. Panel D shows that the managerial accounting professors have an average of 1.42 *FT50* publications, which mirrors the average of the finance professors in our sample (1.44). In contrast, financial accounting professors (0.74) and taxation professors (0.25) have substantially fewer *FT50* publications on average. Panels E and F report similar results when we focus on publications in A respectively A+ journals according to the *JQL3*.

Panels G to I of Table II-8 shows our results for the holistic view on all journal publications. Panel G reports the results regarding the *JQL3* Score and finds that managerial accounting professors have the highest average score (2.33) compared to financial accounting (1.97) and taxation (1.88) professors. We find similar results when applying the *SJR* Score in Panel H. Again, managerial accounting professors have the highest average score (1.02) in comparison to financial accounting (0.71) and taxation (0.67) professors. Lastly, we focus on the *SNIP* Score in Panel I and find a similar pattern again: managerial accounting professors have the highest average score (1.75) when compared to financial accounting (1.27) and taxation (0.93) professors.

Table II-8: Accounting sub-fields

PANEL A: Share of Publications with German Title	**N**	**Mean**	**Mean Remaining Accounting Fields**	**Difference**	**p-value**
Financial Accounting Professors	74	67.51%	65.52%	1.99pp	0.8067
Managerial Accounting Professors	69	56.34%	71.91%	-15.57pp	0.0001***
Taxation Professors	48	78.70%	62.12%	16.58pp	0.0000***
PANEL B: Share of Publications in DACH Region Journals	**N**	**Mean**	**Mean Remaining Accounting Fields**	**Difference**	**p-value**
Financial Accounting Professors	74	75.91%	74.86%	1.05pp	0.9581
Managerial Accounting Professors	69	67.99%	79.39%	-11.40pp	0.0012***
Taxation Professors	48	84.75%	72.09%	12.66pp	0.0004***
PANEL C: Share of Publications in Practitioner Journals	**N**	**Mean**	**Mean Remaining Accounting Fields**	**Difference**	**p-value**
Financial Accounting Professors	74	35.18%	35.88%	-0.71pp	0.9069
Managerial Accounting Professors	69	31.84%	37.74%	-5.90pp	0.1406
Taxation Professors	48	41.70%	33.57%	8.13pp	0.0776*
PANEL D: FT50	**N**	**Mean**	**Mean Remaining Accounting Fields**	**Difference**	**p-value**
Financial Accounting Professors	74	0.73	0.94	-0.21	0.2900
Managerial Accounting Professors	69	1.42	0.54	0.88	0.0760*
Taxation Professors	48	0.25	1.06	-0.81	0.0016***
PANEL E: JQL3 ≥A	**N**	**Mean**	**Mean Remaining Accounting Fields**	**Difference**	**p-value**
Financial Accounting Professors	74	1.51	1.97	-0.42	0.7937
Managerial Accounting Professors	69	2.64	1.34	1.29	0.0126**
Taxation Professors	48	1.02	2.08	-1.06	0.0136**
PANEL F: JQL3 = A+	**N**	**Mean**	**Mean Remaining Accounting Fields**	**Difference**	**p-value**
Financial Accounting Professors	74	0.32	0.42	-0.09	0.0478**
Managerial Accounting Professors	69	0.59	0.26	0.33	0.8111
Taxation Professors	48	0.17	0.45	-0.29	0.0506*
PANEL G: JQL3 Score	**N**	**Mean**	**Mean Remaining Accounting Fields**	**Difference**	**p-value**
Financial Accounting Professors	74	2.03	2.16	-0.13	0.9946
Managerial Accounting Professors	69	2.33	1.98	0.34	0.5690
Taxation Professors	48	1.92	2.17	-0.25	0.5224

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Table II-8 continued from previous page

PANEL H: SJR Score	**N**	**Mean**	**Mean Remaining Accounting Fields**	**Difference**	**p-value**
Financial Accounting Professors	74	0.73	0.88	-0.14	0.8550
Managerial Accounting Professors	69	1.02	0.71	0.30	0.1438
Taxation Professors	48	0.68	0.87	-0.19	0.0679*
PANEL I: SNIP Score	**N**	**Mean**	**Mean Remaining Accounting Fields**	**Difference**	**p-value**
Financial Accounting Professors	74	1.30	1.42	-0.12	0.7923
Managerial Accounting Professors	69	1.75	1.16	0.59	0.0214**
Taxation Professors	48	0.95	1.52	-0.57	0.0044***

Notes: This table provides descriptive information regarding on our publication behavior variables for the three accounting sub-fields. Furthermore, the table displays results of a Mann-Whitney U test regarding the statistical difference between the mean of the current sub-field and the mean of the two remaining sub-fields. Significance levels are denoted as follows: *p $<$ 0.1, **p $<$ 0.05, ***p $<$ 0.01.

Overall, our analyses regarding the accounting sub-fields yield interesting results. We find that especially the taxation professors have the strongest national focus, whereas managerial and financial accounting professors publish more internationally. Furthermore, we find that managerial accounting professors focus on publishing in particularly highly rated journals as more than one-third have at least one publication in a *FT50* journal or a journal classified at least as an A journal according to the *JQL3* (not reported). This is also evident when looking at the entire publication records, where our findings indicate that managerial accounting professors accumulate the highest score compared to their peers who operate in financial accounting or taxation.

5. Discussion and implications

Based on a hand-collected dataset consisting of all business administration professors in Germany, this paper substitutes anecdotal with empirical evidence regarding the differences in publication behavior between different business administration fields, where we focus especially on accounting researchers. While we are aware that the term "publication behavior" might contain more dimensions than we analyze in this paper, e.g., the structure of professional networks or publications in other outlets like legal comments, we focus on

journal publications exclusively and address four particular dimensions. First, we analyze differences regarding the national focus. Second, we study differences in terms of a focus on practitioner journals. Third, we investigate differences concerning the focus on publications in highly rated international journals. Fourth, we provide evidence regarding the entire publication portfolio of the professors as measured by a coauthor-weighted count variable based on different journal ratings.

Our results highlight significant differences between the different business administration fields. Concretely, we show that accounting professors publish a substantial fraction of their papers with German titles or in DACH region journals. In contrast, our analyses highlight that operations professors have a strong international focus. Additionally, we present evidence that accounting professors focus more strongly on publications in practitioner journals. The tendency of accounting professors to publish more in practitioner journals and for a German audience, might be one reason why accounting professors publish least often in highly rated international journals, whereas marketing or operations professors frequently publish in those journals. When we analyze the entire publication records of professors as measured by scores based on journal ratings, we also find that accounting professors accumulate lower aggregate scores compared to the remaining business administration fields.

In order to decompose our finding that accounting professors differ with respect to the four dimensions of publication behavior, we analyze whether the observed differences can be explained by common factors. Conducting a Blinder-Oaxaca decomposition, however, we find that the paramount part of the differences between fields cannot be explained by common factors. In addition, we explore whether accounting professors differ with respect to their publication training from the professors in the remaining fields. Regarding our proxy for publication training, i.e., whether a professor lists an international visit in the CV, we find that accounting professors less often report such an international visit. However, the difference is rather small in magnitude and only statistically significant at the 10 percent level. We find that international visits, on the one hand, are negatively related to the fraction of publications for a national audience as well for practitioners. On

the other hand, professors with an international visit have more publications in highly rated journals as well as higher scores for the holistic view on the publication output. In addition, our proxy for publication training does not affect accounting professors differently compared to their peers in the other fields. Consequently, differences in publication training cannot explain the differences in our publication behavior variables. Finally, we find that within the field of accounting, taxation and financial accounting professors are the main driver of the results for accounting professors. These sub-fields are more concerned with German law and regulations, thus publish more for a German audience. In addition, taxation and financial accounting professors have a weaker presence in international journals compared to professors in managerial accounting.

The finding that publication behavior in accounting differs strongly regarding many aspects compared to the remaining business administration fields corresponds to findings of previous research. For example, Grossmann et al. (2019) and Templeton and Lewis (2015) provide evidence against so-called "inclusion fairness" for accounting scholars, i.e., they show that there is fewer publication space in highly rated accounting journals compared to other business administration fields. Similar observations are made by Korkeamäki et al. (2018) who show that the value of a single-authored publication in a top-rated journal is highest in accounting as opposed to finance or marketing for example. Our analyses provide complementing evidence that accounting professors find it more difficult to publish in highly rated journals. Not only is it more difficult for accounting researchers in general to claim rare spots in highly rated journals (e.g., Grossmann et al. (2019)), German accounting researchers also have to cope with an additional disadvantage in the publication game. I.e., these researchers particularly conduct research on topics, which are primarily relevant for a national audience and thus have lower chances of their work being published in international journals.

Our paper contains several important implications for resource allocation. First and most importantly, our paper contains implications regarding the distribution of research funds within business administration faculties. In many universities, research funds are distributed based on the research output of the professors (Hicks 2012). Typically,

professors with more publications or more publications in more highly rated journals will receive a higher share of the funds that the faculty can distribute among the professors. According to the findings of our study, accounting professors could potentially receive a rather low fraction of the allocated funds, if these measures were applied naively. In contrast, marketing professors, which publish most often in highly rated journals, are likely to attract the largest funding in the resource allocation process.

Thus, faculties should think about putting allocation mechanisms in place, which do not naively compare professors in different disciplines according to a measure like the number of publications in a highly rated journal. For example, one remedy is to compare professors within their field and not to their colleagues within the faculty. For example, if an accounting professor belongs to the most successful accounting professors with regard to our measures for publication output (e.g., if the professor ranks in the highest quintile of the accounting professors in Germany), a faculty might want to treat this professor equally to a marketing professor in the top quintile in her field. Admittedly, this approach is difficult to execute, since publication records of the peers in each field are not readily available. A second approach – which is less cumbersome with respect to data gathering – might be to adjust the research output of the professors for the highlighted behavioral differences. Such an approach has been suggested by Korkeamäki et al. (2018) and could be applied prior to the performance-based allocation of funds within business administration faculties. Concretely, exchange rates between the fields might be an option to account for behavioral differences between fields.

Two additional implications of the documented differences in publication behavior for resource allocation are the acquisition of competitive third party funding and the recruiting for new professorship positions, especially in the case of broader calls for applications. E.g., there are cases where professorships in the field “Finance and Accounting” have been advertised. If candidates from the two fields are evaluated based on one of the journal ratings applied in this study, the applicants from the field of accounting are likely having a hard stance. A similar issue can emerge when a faculty has to decide in which field a new professorship should be created. Although this decision will be largely guided by strategic

decision content-wise, screening the potential candidates might also influence the decision. E.g., if a position is being created at the intersection of finance and financial accounting, a job market research might reveal that there are a number of candidates with at least five A+ publications in finance, whereas few potential candidates with at least five A+ publications might be identified for the field of financial accounting. In this hypothetical example, the professorship might be created in the field of finance and not in financial accounting. Finally, the competition on competitive third party funding can also be influenced by differences in publication behavior as funding depends on the research output of professors (Grunig 1997). However, we believe that the issue is less critical here, since applications of finance professors are refereed by finance professors and the same holds true for accounting professors.

6. References

Ayaita, Adam, Kerstin Pull, and Uschi Backes-Gellner. 2019. You get what you 'pay' for: academic attention, career incentives and changes in publication portfolios of business and economics researchers. *Journal of Business Economics* 89 (3): 273–290.

Bäker, Agnes, Susanne Breuninger, and Kerstin Pull. 2021. Pushing performance by building bridges: Human and social capital as mechanisms behind the mobility-performance link. *Journal of Vocational Behavior* 129: 103613.

Bannier, Christina, Tobias Meyll, Florian Röder, and Andreas Walter. 2019. The gender gap in 'Bitcoin literacy'. *Journal of Behavioral and Experimental Finance* 22: 129–134.

Beckmann, Klaus, and Andrea Schneider. 2013. The interaction of publications and appointments: new evidence on academic economists in Germany. *Education Economics* 21 (4): 415–430.

Blinder, Alan S. 1973. Wage discrimination: Reduced form and structural estimates. *The Journal of Human Resources* 8 (4): 436–455.

Brähler, E., and B. Strauss. 2009. Leistungsorientierte Mittelvergabe an Medizinischen Fakultäten Eine aktuelle Ubersicht. *Bundesgesundheitsblatt, Gesundheitsforschung, Gesundheitsschutz* 52 (9): 910–916.

Buchheit, Steve, Denton Collins, and Austin Reitenga. 2002. A cross-discipline comparison of top-tier academic journal publication rates: 1997-1999. *Journal of Accounting Education* 20 (2): 123–130.

Clermont, Marcel. 2016. Effectiveness and efficiency of research in Germany over time: an analysis of German business schools between 2001 and 2009. *Scientometrics* 108 (3): 1347–1381.

Ductor, Lorenzo. 2015. Does Co-authorship Lead to Higher Academic Productivity? *Oxford Bulletin of*

Economics and Statistics 77 (3): 385–407.

Eisend, Martin. 2011. Is VHB-JOURQUAL2 a good measure of scientific quality? Assessing the validity of the major business journal ranking in German-speaking countries. *Business Research* 4 (2): 241–274.

Eisend, Martin, and Pakize Schuchert-Güler. 2015. Journal publication success of German business researchers: does gender composition and internationality of the author team matter? *Business Research* 8 (2): 171–188.

Fassin, Yves. 2021. Does the Financial Times FT50 journal list select the best management and economics journals? *Scientometrics* 126 (7): 5911–5943.

Fülbier, Rolf U., and Manuel Weller. 2011. A Glance At German Financial Accounting Research between 1950 and 2005: A Publication and Citation Analysis. *Schmalenbach Business Review* 63: 2–33.

González-Pereira, Borja, Vicente P. Guerrero-Bote, and Félix Moya-Anegón. 2010. A new approach to the metric of journals' scientific prestige: The SJR indicator. *Journal of Informetrics* 4 (3): 379–391.

Graber, Michael, Andrey Launov, and Klaus Wälde. 2008. Publish or perish? The increasing importance of publications for prospective economics professors in Austria, Germany and Switzerland. *German Economic Review* 9 (4): 457–472.

Grossmann, Axel, Lowell Mooney, and Michael Dugan. 2019. Inclusion fairness in accounting, finance, and management: An investigation of A-star publications on the ABDC journal list. *Journal of Business Research* 95: 232–241.

Grunig, Stephen D. 1997. Research, Reputation, and Resources. *The Journal of Higher Education* 68 (1): 17–52.

Hicks, Diana. 2012. Performance-based funding for public research in tertiary education institutions. *Research Policy* 41 (2): 251–261.

Hilber, Simon, Jan-Egbert Sturm, and Heinrich W. Ursprung. 2021. Frauenanteil und geschlechtsspezifische Produktivitätsunterschiede in der volkswirtschaftlichen Forschung.

Perspektiven der Wirtschaftspolitik 22 (2): 156–171.

Hornbostel, Stefan. 2006. Leistungsmessung in der Forschung. In *Von der Qualitätssicherung der Lehre zur Qualitätsentwicklung als Prinzip der Hochschulsteuerung*, ed. Hochschulrektorenkonferenz (HRK), 1, 219–228. Bonn.

Hudson, John, and David N. Laband. 2013. Using and interpreting journal rankings: introduction. *The Economic Journal* 123 (570): F199-F201.

Jokinen, Juho, and Jaakko Pehkonen. 2017. Promotions and earnings – gender or merit? Evidence from longitudinal personnel data. *Journal of Labor Research* 38 (3): 306–334.

Korkeamäki, Timo, Jukka Sihvonen, and Sami Vähämaa. 2018. Evaluating publications across business disciplines: Inferring interdisciplinary "exchange rates" from intradisciplinary author rankings. *Journal of Business Research* 84: 220–232.

Li, Eldon Y., Chien H. Liao, and Hsiuju R. Yen. 2013. Co-authorship networks and research impact: A social capital perspective. *Research Policy* 42 (9): 1515–1530.

Madison, Guy, and Pontus Fahlman. 2020. Sex differences in the number of scientific publications and citations when attaining the rank of professor in Sweden. *Studies in Higher Education*: 1–22.

Mingers, John, and Hugh Willmott. 2013. Taylorizing business school research: On the 'one best way' performative effects of journal ranking lists. *Human Relations* 66 (8): 1051–1073.

Moed, Henk F. 2010. Measuring contextual citation impact of scientific journals. *Journal of Informetrics* 4 (3): 265–277.

Münch, Richard. 2008. Stratifikation durch Evaluation: Mechanismen der Konstruktion von Statushierarchien in der Forschung. *Zeitschrift für Soziologie* 37 (1): 60–80.

Oaxaca, Ronald. 1973. Male-female wage differentials in urban labor markets. *International Economic Review* 14 (3): 693–709.

Ooms, Jeroen. 2018. *cld2: Google's compact language detector 2 (Version 1.2.1)*.

Rauber, Michael, and Heinrich W. Ursprung. 2008. Life Cycle and Cohort Productivity in Economic Research: The Case of Germany. *German Economic Review* 9 (4): 431–456.

Schrader, Ulf, and Thorsten Henning-Thurau. 2009. VHB-JOURQUAL2: Method, Results, and Implications of the German Academic Association for Business Research's Journal Ranking. *Business Research* 2 (2): 180–204.

Sieweke, Jost, Johannes Muck, Stefan Süß, and Justus Haucap. 2014. Forschungsevaluation an Universitäten - Ergebnisse einer explorativen Studie rechts- und wirtschaftswissenschaftlicher Fakultäten. *Schmalenbachs Zeitschrift für betriebswirtschaftliche Forschung* 66 (4): 274–305.

Sturm, Jan-Egbert, and Heinrich W. Ursprung. 2017. The Handelsblatt rankings 2.0: Research rankings for the economics profession in Austria, Germany, and Switzerland. *German Economic Review* 18 (4): 492–515.

Sugimoto, Cassidy R., and Vincent Larivière. 2018. *Measuring research: What everyone needs to know.* New York, NY: Oxford University Pres.

Swanson, Edward, Christopher Wolfe, and Asghar Zardkoohi. 2007. Concentration in Publishing at Top-Tier Business Journals: Evidence and Potential Explanations. *Contemporary Accounting Research* 24 (4): 1255–1289.

Swanson, Edward P. 2004. Publishing in the majors: A comparison of Accounting, Finance, Management, and Marketing. *Contemporary Accounting Research* 21 (1): 223–255.

Templeton, Gary F., and Bruce R. Lewis. 2015. Fairness in the institutional valuation of business journals. *MIS Quarterly* 39 (3): 523–539.

Valacich, Joseph S., Mark A. Fuller, Christoph Schneider, and Alan R. Dennis. 2006. Issues and opinions—Publication opportunities in premier business outlets: How level is the playing field? *Information Systems Research* 17 (2): 107–125.

Vardi, Moshe Y. 2009. Conferences vs. journals in computing research. *Communications of the ACM* 52 (5): 5.

Vardi, Moshe Y. 2010. Revisiting the publication culture in computing research. *Communications of the ACM* 53 (3): 5.

Vidgen, Richard, Michael Mortenson, and Philip Powell. 2019. Invited viewpoint: How well does the Information Systems discipline fare in the Financial Times' top 50 Journal list? *The Journal of Strategic Information Systems* 28 (4).

von Görtz, Regina, Richard Heidler, and Dorothea Jansen. 2010. Chancen für neue Forschungslinien? Leistungsorientierte Mittelvergabe und „ergebnisoffene" Forschung. *Beiträge zur Hochschulforschung* 32 (2): 8–32.

Ynalvez, Marcus A., and Wesley M. Shrum. 2011. Professional networks, scientific collaboration, and publication productivity in resource-constrained research institutions in a developing country. *Research Policy* 40 (2): 204–216.

Zhang, Tenghao. 2021. Will the increase in publication volumes "dilute" prestigious journals' impact factors? A trend analysis of the FT50 journals. *Scientometrics* 126: 863–869.

7. Appendix

Appendix II-A: Appendix II-A 10 most frequent terms in the denominations of the chairs, by field

Field	10 Most Frequent Terms (German)	10 Most Frequent Terms (English)
Accounting	controlling, steuerlehre, wirtschaftspruefung, unternehmensrechnung, accounting, rechnungslegung, rechnungswesen, internationale, allgemeine	controlling, taxation and auditing, audit, corporate accounting, accounting, billing/accounting, book-keeping, international, general
Business Information Systems	wirtschaftsinformatik, information, systems, business, informationsmangement, management, support, anwendungssysteme, ebusiness, itmanagement	business information systems, information, systems, business, information management, management, support, application systems, e-business, IT management
Finance	finance, finanzwirtschaft, finanzierung, banken, finanzdienstleistungen, abwl, financial, corporate, bank, bankbetriebslehre	finance, finance, factoring, banks, financial services, general business administration, financial, corporate, bank, banking management
Management	management, organization, personal, unternehmensführung, internationals, strategisches, supply, fuehrung, business, personalmanagement	management, organization, personal, business management, international, strategic, supply, leadership, business, human resource management
Marketing	marketing, sales, handel, konsumentenverhalten, dienstleistungsmarketing, innovation, business, management, international, markenmanagement	marketing, sales, trade, consumer behavior, service marketing, innovation, business, management, international, brand marketing
Operations	entrepreneurship, management, innovationsmanagement, logistik, technologie, operations, production, produktionswirtschaft, innovation, technologiemanagement	entrepreneurship, management, innovation management, logistics, technology, operations, production, production management, innovation, technology management
Other	wirtschaftspaedagogik, statistik, didaktik, lernen, bildung, corporate, wirtschaft, nachhaltige, organisations, entrepreneurship	business education, statistics, didactics, learning, education, corporate, economy, sustainable, organizational, entrepreneurship

Notes: This table shows the ten most frequent terms in the denominations of the chairs in each field of business administration. We derive these by performing textual analysis with the denominations of the chairs in our sample. Prior to counting the ten most frequent terms, we remove general terms such as *Professor* (professor), *Professur* (professorship), *Lehrstuhl* (chair) or *Betriebswirtschaftslehre* (business administration).

Appendix II-B: List of most common DACH region journals

30 Most Frequent DACH Region Journals
Journal of Business Economics
Wirtschaftwissenschaftliches Studium
Schmalenbachs Zeitschrift für betriebswirtschaftliche Forschung
Der Betrieb
Das Wirtschaftsstudium
Business Administration Review
Business & Information Systems Engineering
Die Wirtschaftsprüfung
Controlling, Zeitschrift für erfolgsorientierte Unternehmenssteuerung
Betriebswirtschaftliche Forschung und Praxis
BetriebsBerater
Controlling & Management Reivew
Marketing, Zeitschrift für Forschung und Praxis
Finanz Betrieb
Zeitschrift für internationale und kapitalmarktorientierte Rechnungslegung
Zeitschrift Führung und Organisation
Der Steuerberater
Journal of Management Control
OR Spectrum
Die Unternehmung – Swiss Journal of Business Research and Practice
Schmalenbach Business Review
Deutsches Steuerrecht
Steuern und Bilanzen
Die Bank
Marketing Review St. Gallen
Credit and Capital Markets
Absatzwirtschaft, Zeitschrift für Marketing
Zeitschrift für Personalforschung
HMD – Praxis der Wirtschaftsinformatik
Zeitschrift für das gesamte Kreditwesen

Notes: This table displays the 30 most common DACH region journals that are included in our dataset.

Appendix II-C: Lists of highly rated journals

Financial Times' Top 50 Journals	VHB Jourqual 3 ≥ A	VHB Jourqual 3 = A+
Academy of Management Journal	Academy of Management Journal	Academy of Management Journal
Academy of Management Review	Academy of Management Review	Academy of Management Review
Accounting, Organizations and Society	Accounting, Organizations and Society	Administrative Science Quarterly
Administrative Science Quarterly	Administrative Science Quarterly	American Economic Review
American Economic Review	American Economic Review	Econometrica
Contemporary Accounting Research	Contemporary Accounting Research	Information Systems Research
Econometrica	Discrete Applied Mathematics	Journal of Accounting and Economics
Entrepreneurship Theory and Practice	Econometrica	Journal of Accounting Research
Harvard Business Review	Entrepreneurship: Theory and Practice	Journal of Consumer Research
Human Relations	European Accounting Review	Journal of Finance
Human Resource Management	European Journal of Information Systems	Journal of Financial Economics
Information Systems Research	European Journal of Operational Research	Journal of Marketing
Journal of Accounting and Economics	Experimental Economics	Journal of Marketing Research
Journal of Accounting Research	Health Care Management Science	Journal of Political Economy
Journal of Applied Psychology	Health Economics	Management Science
Journal of Business Ethics	Health Services Research	Marketing Science
Journal of Business Venturing	IISE Transactions	MIS Quarterly
Journal of Consumer Psychology	Industrial and Labor Relations Review	Operations Research
Journal of Consumer Research	Information Systems Journal	Organization Science
Journal of Finance	Information Systems Research	Review of Financial Studies
Journal of Financial and Quantitative Analysis	INFORMS Journal on Computing	Science
Journal of Financial Economics	International Journal of Research in Marketing	The Accounting Review
Journal of International Business Studies	Journal of Accounting and Economics	
Journal of Management	Journal of Accounting Research	
Journal of Management Information Systems	Journal of Applied Psychology	

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Journal of Management Studies	Journal of Banking and Finance
Journal of Marketing	Journal of Business Venturing
Journal of Marketing Research	Journal of Consumer Psychology
Journal of Operations Management	Journal of Consumer Research
Journal of Political Economy	Journal of Economic Behavior and Organization
Journal of the Academy of Marketing Science	Journal of Economic Dynamics and Control
Management Science	Journal of Economics and Management Strategy
Manufacturing and Service Operations Management	Journal of Finance
Marketing Science	Journal of Financial and Quantitative Analysis
MIS Quarterly	Journal of Financial Economics
Operations Research	Journal of Financial Intermediation
Organization Science	Journal of Health Economics
Organization Studies	Journal of Industrial Ecology
Organizational Behavior and Human Decision Processes	Journal of Information Technology
Production and Operations Management	Journal of International Business Studies
Research Policy	Journal of Labor Economics
Review of Accounting Studies	Journal of Management
Review of Economic Studies	Journal of Management Information Systems
Review of Finance	Journal of Management Studies
Review of Financial Studies	Journal of Marketing
Sloan Management Review	Journal of Marketing Research
Strategic Entrepreneurship Journal	Journal of Money, Credit and Banking
Strategic Management Journal	Journal of Operations Management
The Accounting Review	Journal of Organizational Behavior
	Journal of Political Economy
	Journal of Product Innovation Management

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Appendix II-C continued from previous page

	Journal of Public Administration Research and Theory
	Journal of Public Economics
	Journal of Retailing
	Journal of Risk and Insurance
	Journal of Scheduling
	Journal of Service Research
	Journal of Strategic Information Systems
	Journal of the Academy of Marketing Science
	Journal of the Association for Information Systems
	Leadership Quarterly
	Management Accounting Research
	Management Science
	Manufacturing and Service Operations Management
	Marketing Science
	Mathematical Programming
	Mathematics of Operations Research
	Medical Decision Making
	MIS Quarterly
	National Tax Journal
	Operations Research
	OR Spectrum
	Organization Science
	Organization Studies
	Organizational Behavior and Human Decision Processes
	Organizational Research Methods
	Personnel Psychology
	PharmacoEconomics
	Production and Operations Management

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		RAND Journal of Economics
		Research Policy
		Review of Accounting Studies
		Review of Derivatives Research
		Review of Finance
		Review of Financial Studies
		Science
		SIAM Journal on Computing
		Strategic Entrepreneurship Journal
		Strategic Management Journal
		The Accounting Review
		The Academy of Management Annals
		Transportation Science

Notes: This table displays the journals included in the *Financial Times' top 50 journals* (column 1), the journals that are at least A journals according to the *VHB Jourqual 3* (column 2), and the journals that are A+ journals according to the *VHB Jourqual 3* (column 3) that are included in our dataset.

Appendix II-D: Appendix II-A Lists of journals with highest points according to SJR and SNIP

Journals with the highest *SJR* points (1.0)	**Journals with the highest *SNIP* points (1.0)**
Academy of Management Journal	Academy of Management Journal
Academy of Management Review	Academy of Management Review
Administrative Science Quarterly	ACM Computing Surveys
American Economic Journal: Applied Economics	Administrative Science Quarterly
American Economic Review	American Economic Journal: Applied Economics
Econometrica	American Economic Review
Journal of Accounting and Economics	American Sociological Review
Journal of Economic Literature	California Management Review
Journal of Finance	Communications of the ACM
Journal of Financial Economics	Econometrica
Journal of Labor Economics	Evolutionary Computation
Journal of Marketing	Harvard Business Review
Journal of Monetary Economics	IEEE Computer
Journal of Political Economy	IEEE Pervasive Computing
Management Science	IEEE Transactions on Evolutionary Computation
Organization Science	IEEE Transactions on Knowledge and DATA Engineering
Quarterly Journal of Economics	IEEE Transactions on Software Engineering
Review of Economic Studies	International Journal of Management Reviews
Review of Financial Studies	Journal of Business Venturing
Science	Journal of Economic Literature
Strategic Management Journal	Journal of Economic Perspectives
The Academy of Management Annals	Journal of Finance
	Journal of Financial Economics
	Journal of Management
	Journal of Marketing
	Journal of Operations Management
	Journal of Political Economy
	Journal of the Academy of Marketing Science
	Journal of the European Economic Association
	Management Science
	MIS Quarterly
	Organizational Research Methods

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Appendix II-D continued from previous page

	Psychological Bulletin
	Psychological Review
	Quarterly Journal of Economics
	Review of Economic Studies
	Review of Financial Studies
	Science
	Sloan Management Review
	The Academy of Management Annals

Notes: This table displays the highest rated (1.0 points) journals according to the *SCImago Journal Rank* (column 1) and the *Source-Normalized Impact Factor* (column 2) that are included in our dataset.

III. The Times They Are a-Changin': Profiling Newly Tenured Business Economics Professors in Germany over the Past Thirty Years

Co-authors:

Andreas Walter

Own share:

75%

This article is currently under review at:

Journal of Business Economics (VHB-JOURQUAL 3: B),

2nd round of review

The Times They Are a-Changin': Profiling Newly Tenured Business Economics Professors in Germany over the Past Thirty Years

Mario Fernandes[a] Andreas Walter[b]

Abstract – This study examines how the profiles of newly tenured business economics professors in Germany did change over the past thirty years. We document that business economics professors did become more diverse over time, e.g. in terms of their gender and the internationality of their education. Furthermore, we show that the size of the professional networks did increase strongly during our investigation period and that professors who obtained tenure more recently publish with a stronger international focus than their peers who obtained tenure in earlier years. Most importantly, we find that publication requirements have changed for newly tenured business economics professors over the past thirty years as we document increasing standards concerning publications in highly renowned international journals. However, we find that traditional German business economics journals (e.g., the *Journal of Business Economics* and the *Schmalenbach Business Review*) still are highly relevant outlets for recently tenured business economics professors. By documenting and quantifying these effects, our study contributes to research on business economics professors in *times they are a-changin'*.

Keywords: Business economics, journal articles, publication benchmarking, profiling, time trends

JEL Codes: A14; I23; M10

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"If your time to you is worth savin'
Then you better start swimmin' or you'll sink like a stone
For the times, they are a-changin'"
Bob Dylan – The Times They Are a-Changin'

1. Introduction

Business economics researchers faced changing economic incentives caused by a multitude of new reforms in the higher education and public research sector in recent years. In particular, the introduction of New Public Management (NPM), i.e. the implementation of market structures in the public sector (Schmoch and Schubert 2010; Schubert 2009), and journal rankings (Buehling 2021; Vogel et al. 2017) as well as the concomitant implementation of performance-based funding approaches in universities (Hicks 2012; Sieweke et al. 2014) have impacted researchers in business economics substantially. Especially junior researchers who have not received a tenured professorship are impacted by these reforms as they face increasing pressure to 'publish or perish' in order to obtain their career goals (Backes-Gellner and Schlinghoff 2010; Graber et al. 2008). This paper investigates how the profiles of newly tenured business economics professors in Germany who were exposed to these reforms have changed from the 1990s to the 2010s. In particular, we focus on four dimensions to analyze the respective profiles. These dimensions comprise the demographic characteristics, the professional networks, the internationalization of research, and changing requirements concerning publications in highly renowned international journals of the professors. Especially our last dimension contains important implications on the development of tenure requirements in business economics over time.

Thereby, our paper contributes to the literature in multiple ways. *First*, our paper contributes to literature about the career paths of German business economics professors. In the late 2000s, a series of papers was published dealing with career paths of business and economics professors in particular with regard to the publication requirements for obtaining a tenured position (Fabel et al. 2008; Graber et al. 2008; Rauber and Ursprung 2008; Schulze et al. 2008). More recently, there is a growing body of literature that deals

with other attributes of German business economics researchers such as (international) mobility (Bäker 2015; Bäker et al. 2016; Bäker et al. 2021), changing publication patterns (Ayaita et al. 2019), or the opportunity costs of leadership positions in academia (Backes-Gellner et al. 2018).

Second, our paper contributes to the international literature regarding so-called publication benchmarks necessary to obtain tenured professorships (Beattie and Goodacre 2012; Dean et al. 2011; Dennis et al. 2006; Glover et al. 2012; Glover et al. 2006; Goodacre et al. 2021). While most of these papers typically only focus on certain sub-fields of business economics like accounting or business information systems, our paper provides a comprehensive overview over the entire business economics discipline.

Third, our paper contributes to literature on the preferences of appointing committees in business economics. Fiedler and Welpe (2008) investigate into the factors that are important determinants for universities in the German-speaking countries in order to appoint management professors. Beckmann and Schneider (2013) also address the aspect of appointment preferences in German economics. Yet, they focus explicitly on the impact of publications in order to obtain tenure. Our paper adds to that literature by exploring how these preferences might have changed over time.

In order to extensively analyze the profiles of newly tenured business economics professors, we focus on four dimensions. First, we turn to general characteristics of newly tenured professors, such as their gender or the age at which they obtain their first tenured professorship. Schulze et al. (2008) and Röbken (2009) provide an overview over some characteristics such as the gender or the international mobility of business and economics professors located in Austria, Germany, and Switzerland as of 2006 respectively 2008.[1] Consequently, our literature review did not yield any research on that matter that covers developments over the past 10 years. While there is evidence that the fraction of female economics professors did increase in the DACH region (see, e.g., Hilber et al. (2021)), our literature review yielded no empirical evidence regarding changes of the age at which

[1] Henceforth, we refer to these three countries as the DACH (D = Germany, A = Austria, CH = Switzerland) countries.

professors did obtain their first tenured professorship as well as changes in terms of the fraction of professors who spend time abroad[2]. Furthermore, we extend previous literature by also analyzing whether the fraction of professors who received their PhD from particularly renowned universities in the DACH region did change over time as well.

The second dimension refers to the professional networks of the professors. It is well established in literature that academic networks are important determinants for academic success (Bordons et al. 2015; Gonzalez-Brambila et al. 2013; Li et al. 2013; McCarty et al. 2013; Werker and Hopp 2020; Ynalvez and Shrum 2011). In addition, there is also empirical evidence documenting academic networks in management (Acedo et al. 2006), in finance (Walter 2011), and in economics (Jones 2021) to increase over time. However, this evidence does not necessarily imply that similar patterns are also observable for business economics professors in Germany. Hence, we supplement previous research by analyzing how the professional networks of newly tenured business economics professors in Germany evolves over time.

Third, we investigate the national focus of the professors. An often cited criticism of journal rankings is that they lead researchers to increasingly follow international standards and that diversity and creativity in research might suffer as a result (Osterloh and Frey 2015; Rost and Frey 2011). Recently, Buehling (2021) provides causal evidence for that claim by documenting a convergence of topics investigated by German-based economics researchers towards their international peers as a consequence of the introduction of the *Handelsblatt* ranking.[3] Rapp et al. (2019) investigate the internationalization of German accounting researchers, being one sub-field of business economics. They find an increasing level of internationalization in terms of research methods and research content between 1985 and 2015. Yet, the question whether newly tenured professors in Germany in general publish more internationally remains an open question empirically. Our paper adds to

[2] The fact that there is no empirical evidence regarding changes in substantial visits abroad is rather surprising as there is recent evidence, which highlights the importance for researchers to spend time abroad in order to accumulate human and social capital (Bäker et al. 2021).

[3] The *Handelsblatt* ranking is a German ranking that ranks journals, researchers, and universities in terms of their publication output in business and economics. For more information please refer to Lorenz and Löffler (2015) or Sturm and Ursprung (2017).

literature by exploring the development of the national focus by newly tenured business economics professors in Germany.

Our fourth dimension concerns the changing publication requirements for obtaining a tenured professorship. In particular, we explore whether hiring committees put more emphasis on publications in highly renowned (international) journals. Recent literature stresses that such publications are crucial for the career success of junior researchers in business and economics internationally (Bajo et al. 2020; Heckman and Moktan 2020). This trend has also been documented for business and economics researchers in the DACH countries (Graber et al. 2008; Schulze et al. 2008). However, our literature review did not yield any current evidence on that matter. While anecdotal evidence suggests that the relevance of publications in highly renowned journals has been increasing in recent years, to the best of our knowledge there is no quantification of this trend. Our paper fills this gap by providing empirical evidence on the focus on top publications of newly tenured business economics professors between the 1990s and the 2010s. By focusing on this dimension, our paper provides evidence on the changes of tenure requirements in German business economics.

In order to analyze the profiles of newly tenured business economics professors, our study draws on a unique, hand-collected data set. This data set comprises of 781 business economics professors who obtained their first tenured professorship in Germany between 1990 and 2018. We merge this data set with publication data obtained from the online research monitoring portal *Forschungsmonitoring* in order to investigate the professional networks, the national focus of publications, and the focus on top publications of the professors in our sample.[4]

Our main findings are that newly appointed German business economics professors become more diverse over time, e.g. in terms of their gender and the heterogeneity of their educational backgrounds. Furthermore, we find that the professional networks of newly

[4] For more detailed information regarding the data provided by *Forschungsmonitoring* please refer to Hilber et al. (2021) and Sturm and Ursprung (2017).

appointed professors grow over time and that the size of coauthor teams also increases over time. Our results also show that newly appointed business economics professors in Germany publish more and more internationally. While professors who obtained tenure in the 1990s published a large fraction of their work in German or in German outlets, professors who obtained tenure more recently also publish a considerable fraction of their papers internationally. Lastly, we document an increasing focus on publications in highly renowned journals, e.g. A and A+ journals according to the *Jourqual 3.* (*JQL3*)

Our paper contains important practical implications, especially for junior researchers striving to become tenured business economics professors. By documenting how the requirements to obtain a tenured professorship did change over time, we provide guidance for junior researchers on the necessary appointment benchmarks they have to fulfill. Furthermore, our results yield insights into potential strategies, for example regarding the composition of the professional networks that might be helpful in obtaining the first tenured professorship.

The remainder of our paper is organized as follows. Section 2 briefly presents characteristics of the career stages towards a full professorship at a German university and describes the hiring process to obtain a full professorship. In Section 3, we introduce the data and variables used in our study. Section 4 presents our main results, while Section 5, presents additional analyses. Finally, we discuss our results in Section 0.

2. The Institutional Framework in Germany

German academia is an interesting academic labor market because of its open competition for tenured professorships. For many decades, a tenure-track system was absent in Germany, and in contrast to the Anglo-American system, German universities provide only few tenured positions below full professor (Lutter and Schröder 2016). Consequently, almost every postdoctoral researcher either drops out of the system or becomes a tenured full professor at a university distinct from his postdoctoral institution.

Typically, there are three stages before becoming a tenured professor in Germany. In the first stage, a junior researcher is a doctoral student earning a PhD. In contrast to the Anglo-American system, in Germany, the majority of doctoral students are employed at a university or research institute (see, e.g., Ambrasat and Tesch (2017); Fitzenberger and Schulze (2014)) and are not financed by scholarships. In the second stage, the junior researcher is a postdoctoral fellow, traditionally called *Habilitand* in Germany – usually without tenure. In 2002, a reform of the Higher Education System (see, e.g., Bäker (2015); Lutter and Schröder (2016)) was passed, which introduced an alternative career path for postdoctoral researchers – the *junior professorship*. In contrast to the position of a *Habilitand*, a junior professor has no formal supervisor and, in addition, has control over a personal research budget. To receive a junior professorship, a junior researcher has to pass an application process comparable to the application process to become a tenured professor. This is in contrast to the application of becoming a *Habilitand*, where the supervisor decides who to employ. Please note, however, that junior professorships usually do not offer a tenure-track option.[5]

The third and last stage is a tenured professorship, which in Germany is typically called the C3/C4, respectively, W2/W3 professorship. As opposed to the Anglo-American system, in Germany, each professor usually holds his or her own academic chair. The German system largely prohibits inbreeding (see, e.g., Bäker (2015)); therefore, a *Habilitand* or junior professor has to change his or her university at least once before obtaining a tenured professorship. The present paper focuses on this "last" step of becoming a tenured professor.

The exemplary hiring process at a German business economics department can be described as follows. Applicants (e.g. *Habilitands*) from other universities apply on a job posting for a new professorship, e.g. a professorship in *Human Resource Management*. As professors in Germany typically do not become professors in general (e.g. for business economics) but professors in a specific field (e.g. *Human Resource Management*), they have

[5] In 2016, so-called *Qualifikationsprofessuren* have been implemented in Germany, which provide junior researchers with a tenure track comparable to the Anglo-American system. Please note that we do not include professors on this career path in the present paper.

to be evaluated regarding their qualification for this specific field (Hamann 2019). Since most German business economics departments are rather small, they often contain about eight to fifteen professor across all fields of business economics and incumbent professors at the university are usually not specialists in the field of the announced professorship. Thus, there is often no expert for this subject employed by the university. To overcome this shortcoming, hiring committees regularly recruit experts from other universities who have expertise in the field of the new professorship.

The process to finally identify the three most suitable candidates by the hiring committee consists of several stages and is heavily based on the publications of the applicants and on journal rankings (Hüther and Krücken 2018).[6] Based on all applications, the hiring committee has to decide which candidates are invited to an interview with the hiring committee, which typically also includes an oral presentation. In order to conduct this task in an "efficient" manner, the publication lists of candidates are evaluated on the basis of a journal ranking, usually the *JQL3* ranking in German business economics. Regularly, the hiring committee defines quantitative thresholds for applicants to be eligible for the next stage of the hiring process, such as the number of A publications, for example.[7]

Those candidates, who pass the threshold are usually screened in detail concerning their area of expertise and the quality of their research. Finally, about five to eight candidates are invited to present themselves and their research at the business economics department (Hüther and Krücken 2018). After having access to all the information and the personal impression about the candidates, the hiring committee picks around three candidates to request two external referee reports (Seeber and Mampaey 2022). The external referees are usually well-established professors in the field of the new professorship. They may assess various aspects of the applicants' qualifications, but regularly refer to journal rankings to propose the final ranking on which to decide who will be offered the position (Hüther and Krücken 2018).

[6] Usually, the hiring committee receives about 40 to 60 applications on the job posting and has the task to find the three most suitable candidates for the new professorship.

[7] Typically, hiring committees do not account for the amount of coauthors of the publications.

3. Data and Variables

3.1 Sample and publication data

Our sample consists of 781 business economics professors who obtained tenure at a German university between 1990 and 2018 and held a tenured professorship in one of the three DACH countries in 2018. We manually gathered CV information for each professor. For this purpose, we browsed the CVs of the professors that are available online on the webpages of the universities or the personal webpages of the professors. We collected information (year and institution) regarding each career step (graduation, doctorate, habilitation, first tenured professorship) for each professor. Unfortunately, not every professor reports all necessary information. We omitted professors with missing data regarding the year in which they obtained their first tenured professorship, the year in which they were born, the university at which they did obtain their graduation and the university at which they did obtain their PhD.

To address our dimensions regarding the publication patterns, we merge data regarding the publications of the professors in our sample with our initial CV data set. The online research-monitoring portal *Forschungsmonitoring* provides us with this publication data. The *German Economic Association* commenced *Forschungsmonitoring*, which today is quality-approved by both the *Düsseldorf Institute for Competition Economics (DICE)* at Heinrich-Heine University Düsseldorf and the *Konjunkturforschungsstelle KOF* at ETH Zurich. Data from *Forschungsmonitoring* has been used recently in many papers dealing with (business) economics researchers in Austria, Germany, and Switzerland (e.g., Ayaita et al. (2019), Backes-Gellner et al. (2018), Bäker et al. (2021), Joecks et al. (2014)). From this publication data, we only use publications classified as 'research articles', as we focus on journal publications, the most common and widely accepted form to disseminate research (Ayaita et al. 2019; Combes and Linnemer 2003; Sinatra et al. 2016). Additionally, we exclude conference presentations and conference proceedings. We drop professors without any publications prior to their first tenured professorship.

3.2 Variables

From our hand-collected CV data, we create the following variables to capture relevant characteristics of the professors. First, we estimate the *Age at Tenure*, i.e. the difference in years between a professor's birth and the year in which he or she obtained the first tenured professorship. The average *Age at Tenure* in our sample equals about 37 years as can be obtained from Table III-1. Second, we construct a dummy variable called *Female* that equals 1, if a professor is a woman. 17% of the professors in our data are female. Third, we create a dummy variable called *PhD Top Reputation University*, which equals 1, if a professor obtained the PhD at a university with a particularly high reputation in terms of education business economics professors (41% of the professors). We classify these universities based on the number of professors educated at these universities in our data set.[8] Fourth, we introduce a dummy variable called *International PhD* that equals 1, if a professor obtained the PhD in any other country than Germany (11% of the professors). Fifth, we define a dummy variable called *Same University Graduation and PhD* that equals 1, if a professor in our data set obtained the graduation and the PhD from the same university (57% of the professors).

[8] More precisely, we counted the universities at which the professors in our data most frequently obtained their PhD. The ten universities with the most PhD graduates are defined as *PhD Top Reputation University* in our paper. In particular, this list comprises the following institutions: University of Mannheim, Goethe University Frankfurt, University of Münster, University of Cologne, Ludwig Maximilian University of Munich, University of St. Gallen, University of Augsburg, Free University of Berlin, Karlsruhe Institute of Technology, and University of Hamburg.

Table III-1: Descriptive statistics

Variable	N	Mean	Standard Deviation	25% Quantile	Median	75% Quantile
Changin' characteristics						
Age at Tenure	781	37.11	3.37	35.00	37.00	39.00
Female	781	0.17	0.38	0.00	0.00	0.00
PhD Top Reputation University	781	0.41	0.49	0.00	0.00	1.00
International PhD	781	0.11	0.32	0.00	0.00	0.00
Same University Graduation and PhD	781	0.57	0.49	0.00	1.00	1.00
Changin' networks						
# of Different Coauthors	781	6.99	6.59	2.00	5.00	9.00
Average # of Authors per Publication	781	2.07	0.71	1.54	2.00	2.50
Changin' national focus						
Publications with German Title	781	0.53	0.35	0.22	0.55	0.85
Publications in DACH Journals	781	0.62	0.34	0.33	0.67	0.96
Publications in GBE Journals	781	0.14	0.19	0.00	0.08	0.20
At Least One GBE Journal	781	0.58	0.49	0.00	1.00	1.00
Changin' top publications						
# Jourqual A	781	0.88	1.56	0.00	0.00	1.00
At Least One Jourqual A	781	0.39	0.49	0.00	0.00	1.00
# Jourqual A+	781	0.16	0.54	0.00	0.00	0.00
At Least One Jourqual A+	781	0.10	0.30	0.00	0.00	0.00
# FT50	781	0.43	1.05	0.00	0.00	0.00
At Least One FT50	781	0.22	0.41	0.00	0.00	0.00

Notes: This table reports summary statistics regarding the variables used in this study. *Age at Tenure* is defined as the difference in years between a professor's birth and the year in which the professor obtained the first tenured professorship. *Female* is a dummy variable that equals 1, if a professor is a woman. *PhD Top Reputation University* is a dummy variable that equals 1, if a professor obtained the PhD at university with a particularly high reputation in terms of educating business economics professors. *International PhD* is a dummy variable that equals 1, if a professor obtained the PhD in any other country than Germany. *Same University Graduation and PhD* is a dummy variable that equals 1, if a professor obtained the graduation and the PhD from the same university. *# of Different Coauthors* is defined as the number of unique coauthors that the professors collaborated with based on their publications until they obtained their first professorship. *Average # of Authors per Publication* is defined as the average number of authors over all publications that the professors have published until they obtained their first tenured professorship. *Publications with German Title* is defined as the fraction of publications that have a German title in all publications that a professor has published until obtaining the first tenured professorship. *Publications in DACH Journals* is defined as the fraction of publications in journals that originate from one of the three DACH countries in all publications that a professor has published until obtaining the first tenured professorship. *Publications in GBE Journals* is defined as the fraction of publications in traditional German business economics journals in all publications that a professor has published until obtaining the first tenured professorship. *At Least One GBE Journal* is defined as the fraction of professors who have published at least once in a German business economics journals until obtaining the first tenured professorship. *# Jourqual A* is defined as the number of publications in A journals (according to the *Jourqual 3)* a professor has published until obtaining the first tenured professorship. *At Least One Jourqual A* is defined as the fraction of professors that has published at least once in an A journal (according to the *Jourqual 3*) until obtaining the first tenured professorship. *# Jourqual A+* is the number of publications in A+ journals (according to the *Jourqual 3*) a professor has published until obtaining the first tenured professorship. *At Least One Jourqual A+* is defined as the fraction of professors that has published at least once in an A+ journal (according to the *Jourqual 3*) until obtaining the first tenured professorship. *# FT50* is defined as the number of publications in FT50 journals a professor has published until obtaining the first tenured professorship. *At Least One FT50* is defined as the fraction of professors that has published at least once in an FT50 journal until obtaining the first tenured professorship.

Next, we make use of the merged publication data set in order to calculate two variables that capture the professors' networks. First, we create a variable called *# of Different Coauthors*. To calculate this variable, we count the number of different coauthors that a professor in our sample collaborated with until he or she did obtain the first tenured professorship. More precisely, we count the number of unique coauthors that the professors collaborated with based on the publications until they obtained their first tenured professorship. Second, we introduce a variable called *Average # of Authors per Publication*. This variable is defined as the average number of coauthors over all publications that a professor has published until he or she did obtain the first tenured professorship. Our data reveals that the average paper of newly tenured professors has about one coauthor, thus about two authors.

Then, we define four variables to measure the national focus of the professors in our data. First, we make use of Google's Compact Language Detector 2 (Ooms 2018) to identify publications with a German title. Next, we calculate the fraction of *Publications with a German Title* for any professor in our data prior to obtaining the first tenured professorship. Second, we measure the fraction of *Publications in DACH Journals*, by processing all journals included in the publication data by hand and tagging those that originate from one of the three DACH countries. Third, we calculate the fraction of *Publications in German Business Economics (GBE) Journals,* i.e. publications in the *Journal of Business Economics* (formerly *Zeitschrift für Betriebswirtschaft*), the *Schmalenbach Business Review* (now the *Schmalenbach Journal of Business Research*), the *Zeitschrift für betriebswirtschaftliche Forschung*, and *Die Betriebswirtschaft*. Again, we estimate the fraction of these journals based on all publications that a professor has published until obtaining the first tenured professorship. Fourth, we define a dummy variable that equals 1, if a professor has published at least once in such a journal until he or she obtains the first tenured professorship. Based on this dummy, we calculate the fraction of professors with *At Least One GBE Journal* publication.

Finally, we define six variables to capture so-called top publications, i.e. publications in highly renowned journals. For the first four variables, we make use of the journal rating

Jourqual 3 (JQL3), which is issued by the *German Academic Association of Business Research (VHB)*. First, we calculate the number of publications in A journals[9] (*# Jourqual A*), of each professor until obtaining the first tenured professorship. Second, we define a dummy variable that equals 1, if a professor has at least one such publication until he or she did obtain the first tenured professorship. Based on this dummy, we calculate the fraction of professors with *At Least One Jourqual A* publication. We do similar calculations based on publications in A+ journals[10]. In addition, we calculate the number of publications in journals included in the *Financial Times' top 50 journals* (*# FT50*)[11] until a professor obtained the first tenured professorship as well as a dummy variable that equals 1, if a professor has published at least once in such a journal until obtaining the first tenured position. Again, we use this variable to calculate the fraction of professors with *At Least One FT50* publication.

In order to investigate into changes over time, we assign each professor in our data to one of three groups based on the year in which the professors obtained the first tenured professorship. The first group consists of professors who obtained *Tenure in the 1990s*. We use this group as the reference group in our regression models. Both other groups consist of professors who obtain *Tenure in the 2000s* respectively *Tenure in the 2010s*.

4. Results

4.1 Changin' characteristics of professors

Table III-2 provides univariate evidence on how the characteristics of newly tenured business economics professors in Germany changed from the 1990s to the 2010s. We apply a series of Bonferroni-adjusted t-tests in order to identify significant differences between professors who obtained tenure in the three different decades of our observation period.

[9] A journals are defined as leading scientific journal in the field of business economics or its sub disciplines.
[10] A+ journals are defined as outstanding, world-leading scientific journal in the field of business economics or its sub disciplines.
[11] Please refer to Fassin (2021) and Vidgen et al. (2019) for more information regarding FT50 journals.

Our main findings are as follows. First, the age at which professors obtain their first tenured professorship remains rather constant as it revolves around 37 years in all three decades. Second, we find that the share of newly tenured female professors is low in the total sample (16.90%) but increasing over time. In particular, we document a statistically significant increase by a factor of 2.5 from the 1990s (8.97%) to the 2010s (24.18%). Third, the clustering of professors who received their PhD from a top reputation university is rather high (41.10%). Among those professors who obtained tenure in the 1990s, the fraction is highest (46.79%) but not statistically different from the two other decades. Fourth, while statistically not significant, we find an increase in professors who obtained an international PhD from the 1990s (8.33%) to the 2010s (13.55%). Finally, we document that the fraction of professors who stayed at their *alma mater* for obtaining their PhD decreases significantly from the 1990s (74.36%) to the 2010s (55.31%). This finding documents an increasing mobility in more recent generations.

Table III-2: Changin' characteristics

	N	Age at Tenure	Female	PhD Top Reputation University	International PhD	Same University Graduation and PhD
Total Sample	781	37.11	16.90%	41.10%	11.27%	57.49%
[1] Tenure in the 1990s	156	36.38	8.97%	46.79%	8.33%	74.36%
[2] Tenure in the 2000s	352	37.71	14.77%	37.22%	10.79%	51.70%
[3] Tenure in the 2010s	273	36.75	24.18%	42.86%	13.55%	55.31%
Difference [2] – [1]		1.33***	5.76%	-9.40%	2.43%	-22.80%***
Difference [3] – [2]		-0.96***	9.44%***	5.46%	2.79%	3.75%
Difference [3] – [1]		0.37	15.20%***	-3.94%	5.22%	-19.05%***

Notes: This table reports summary statistics regarding the characteristics of the newly tenured professors in our total sample (first row). In addition, this table reports summary statistics for the variables regarding the characteristics of the newly tenured professors dependent on the decade in which the professors obtained their first tenured professorship (second to fourth row). *Age at Tenure* is defined as the difference in years between a professor's birth and the year in which the professor obtained the first tenured professorship. *Female* is a dummy variable that equals 1, if a professor is a woman. *PhD Top Reputation University* is a dummy variable that equals 1, if a professor obtained the PhD at university with a particularly high reputation in terms of educating business economics professors. *International PhD* is a dummy variable that equals 1, if a professor obtained the PhD in any other country than Germany. *Same University Graduation and PhD* is a dummy variable that equals 1, if a professor obtained the graduation and the PhD from the same university. Finally, this table reports the differences between the average values of the professors who obtained tenure in the different decades (fifth to seventh row). We apply a series of Bonferroni-adjusted t-tests in order to determine whether the reported differences are statistically significant from each other. Significance levels are denoted as follows: *p<0.1; **p<0.05; ***p<0.01.

Next, we run a series of Ordinary Least Squares (OLS) respectively Linear Probability Model (LPM) regressions[12] in order to determine whether these differences also persist if we include a set of control variables. In particular, we control for the field of business economics (e.g., accounting or marketing) in which the professors are active as there might be field specific differences regarding the professors' characteristics. To assign the professors in our data a field of business economics, we follow Eisend and Schuchert-Güler (2015) and assign the professors one of the following seven fields: accounting, business information systems (BIS), finance, management, marketing, operations, and other. Since management professors constitute the largest group, we use them as the reference group in all our regression models.

Table III-3 reports the corresponding results. Our regression results show that professors who obtain tenure in the 2000s are about a year (1.29) older compared to their peers who obtained tenure in the 1990s. Furthermore, our results highlight that the share of newly appointed female professors increases significantly from the 1990s to the 2010s. Our regression model indicates that the fraction increases by roughly 5 percentage points between the 1990s and the 2000s and by roughly 14 percentage points between the 1990s and the 2010s. This finding complements evidence on an increasing fraction of female economics professors in the DACH region (Hilber et al. 2021).

In addition, we find that the fraction of professors who received their PhD at a top reputation university did decrease slightly (8.65 percentage points) from the 1990s to the 2000s. However, we do not document a continuing trend of higher heterogeneity in PhD granting institutions in the most recent decade. In terms of mobility, our results show that professors who obtained tenure more recently have been more mobile than their predecessors. If we focus on the fraction of professors who obtained their PhD internationally, we document a significant increase by 5.27 percentage points between the 2010s and the 1990s. Regarding the fraction of professors who obtained their graduation

[12] As four of our dependent variables (*Female*, *PhD Top Reputation University*, *International PhD*, and *Same University Graduation and PhD*) are dummy variables, we re-estimate our models as Logit models. The results remain robust and are available upon request.

and their PhD at the same university, our results show significant differences between the 1990s and the 2000s (22.54 percentage points) respectively between the 1990s and the 2010s (17.58 percentage points).

Table III-3: Changin' characteristics – regressions

Dependent variable:	Age at Tenure	Female	PhD Top Reputation University	International PhD	Same University Graduation and PhD
	(1)	(2)	(3)	(4)	(5)
Mean left-hand side	37.1076	0.1690	0.4110	0.1127	0.5749
Tenure in the 2000s	*1.2881****	*0.0539**	*-0.0865**	*0.0219*	*-0.2254****
	(0.2834)	*(0.0297)*	*(0.0476)*	*(0.0276)*	*(0.0444)*
Tenure in the 2010s	*0.3492*	*0.1428****	*-0.0143*	*0.0527**	*-0.1758****
	(0.3147)	*(0.0347)*	*(0.0499)*	*(0.0303)*	*(0.0466)*
Accounting	-0.2301	-0.0766*	0.0680	-0.1204***	0.1242**
	(0.3557)	(0.0413)	(0.0511)	(0.0306)	(0.0509)
BIS	-0.0647	-0.1707***	0.0574	-0.0664	0.0519
	(0.4696)	(0.0435)	(0.0718)	(0.0462)	(0.0724)
Finance	-0.3493	-0.1169***	0.1631***	-0.0087	0.1168**
	(0.3657)	(0.0415)	(0.0574)	(0.0422)	(0.0563)
Marketing	-0.8032**	-0.0633	0.1934***	-0.0616	0.0328
	(0.3983)	(0.0489)	(0.0609)	(0.0402)	(0.0593)
Operations	-0.0842	-0.0565	-0.1163**	-0.0813**	-0.0308
	(0.3899)	(0.0493)	(0.0554)	(0.0386)	(0.0607)
Other	1.9396***	-0.1107*	-0.0869	-0.0105	-0.0124
	(0.7197)	(0.0612)	(0.0858)	(0.0683)	(0.0925)
Constant	36.5421***	0.1625***	0.4059***	0.1355***	0.6901***
	(0.3015)	(0.0370)	(0.0508)	(0.0321)	(0.0481)
p-value for test: *Tenure in the 2000s* = *Tenure in the 2010s*	0.0008***	0.0066***	0.0665*	0.2449	0.2194
Observations	781	781	781	781	781
R^2	0.0498	0.0413	0.0455	0.0255	0.0445
Adjusted R^2	0.0399	0.0313	0.0356	0.0154	0.0346
F Statistic	5.0523***	4.1548***	4.6041***	2.5225**	4.4893***

Continued on next page

Table III-3 continued from previous page

Notes: This table reports the results of five OLS/LPM regressions. The dependent variables concern the characteristics of the newly tenured professors and are introduced in Section 3. *Age at Tenure* is defined as the difference in years between a professor's birth and the year in which the professor obtained the first tenured professorship. *Female* is a dummy variable that equals 1, if a professor is a woman. *PhD Top Reputation University* is a dummy variable that equals 1, if a professor obtained the PhD at university with a particularly high reputation in terms of educating business economics professors. *International PhD* is a dummy variable that equals 1, if a professor obtained the PhD in any other country than Germany. *Same University Graduation and PhD* is a dummy variable that equals 1, if a professor obtained the graduation and the PhD from the same university. *Tenure in the 2000s* is a dummy variable that equals 1, if a professor obtained the first tenured professorship in the 2000s. *Tenure in the 2010s* is a dummy variable that equals 1, if a professor obtained the first tenured professorship in the 2010s. We control for the field of business economics in which the professors are active that we assign based on the classification provided by Eisend and Schuchert-Güler (2015). All models are estimated using heteroscedasticity-robust standard errors. Additionally, we report p-values from Wald F-Tests, which test the equality of coefficients on *Tenure in the 2000s* and *Tenure in the 2010s*. Significance levels are denoted as follows: *p<0.1; **p<0.05; ***p<0.01.

Regarding the different fields of business economics, we find that accounting, business information systems, and finance professors are less likely to be female than management professors, our reference group in the regressions. Finance and marketing professors are more likely to be educated at a top reputation university than management professors, again our reference group in the regressions. Furthermore, operations professors are less likely to obtain their PhD at a top reputation university compared to their peers in management. Finally, accounting and operations professors are less likely to obtain their PhD internationally as compared to management professors.

4.2 Changin' networks

Table III-4 presents univariate evidence regarding the change of professional networks over time. Again, we apply Bonferroni-adjusted t-tests to determine whether the professors who obtained tenure in the three decades differ in terms of their networks. In general, we find that professional networks did increase over time. For example, while newly tenured professors in the 1990s collaborated with 3.28 different coauthors until they obtained tenure, this value roughly tripled until the 2010s, where the average number of different coauthors equals 10.10. We observe a similar pattern if we focus on the average number of authors per paper. In the 1990s, an average paper was written by 1.56 authors. This value increases by roughly one additional coauthor until the 2010s (2.52).

Table III-4: Changin' networks

	N	# of Different Coauthors	Average # of Authors per Publication
Total Sample	781	6.99	2.07
[1] Tenure in the 1990s	156	3.28	1.56
[2] Tenure in the 2000s	352	6.23	1.95
[3] Tenure in the 2010s	273	10.10	2.52
Difference [2] – [1]		2.95^{***}	0.39^{***}
Difference [3] – [2]		3.87^{***}	0.57^{***}
Difference [3] – [1]		6.82^{***}	0.96^{***}

Notes: This table reports summary statistics regarding the networks of the newly tenured professors in our total sample (first row). In addition, this table reports summary statistics for the variables regarding the networks of the newly tenured professors dependent on the decade in which the professors obtained their first tenured professorship (second to fourth row). *# of Different Coauthors* is defined as the number of unique coauthors that the professors collaborated with based on their publications until they obtained their first professorship. *Average # of Authors per Publication* is defined as the average number of coauthors over all publications that the professors have published until they obtained their first tenured professorship. Finally, this table reports the differences between the average values of the professors who obtained tenure in the different decades (fifth to seventh row). We apply a series of Bonferroni-adjusted t-tests in order to determine whether the reported differences are statistically significant from each other. Significance levels are denoted as follows: *p<0.1; **p<0.05; ***p<0.01.

Again, we estimate two OLS regressions to determine whether these results persist if we account for a series of control variables. In addition to the business economics fields, we also control for the characteristics of the professors introduced in the previous section. We control for the business economics fields since there is evidence suggesting that publication behavior might differ between different business economics fields (see, e.g., Eisend and Schmidt (2014) or Eisend and Schuchert-Güler (2015)). We include control variables regarding the professors' characteristics since there is evidence that international visits might increase the network of researchers (Bäker et al. 2016; Bäker et al. 2021) or that there are gender differences regarding the network sizes and structures (Essen and Smith 2022; Ghosh and Liu 2020; McDowell et al. 2006; Spurk et al. 2015).

Table III-5: Changin' networks – regressions

Dependent variable:	# of Different Coauthors	Average # of Authors per Publication
	(1)	(2)
Mean left-hand side	6.9923	2.0741
Tenure in the 2000s	*3.2414****	*0.4281****
	(0.4456)	*(0.0547)*
Tenure in the 2010s	*6.9210****	*0.9549****
	(0.5336)	*(0.0586)*
Accounting	-0.1783	-0.1634***
	(0.5479)	(0.0567)
BIS	5.0264***	0.3884***
	(1.1124)	(0.1000)
Finance	-0.2625	-0.0520
	(0.5335)	(0.0650)
Marketing	2.0838***	0.3302***
	(0.7084)	(0.0776)
Operations	1.9402**	0.2010***
	(0.8842)	(0.0718)
Other	-0.2741	0.0305
	(0.9030)	(0.1223)
Age at Tenure	-0.0425	-0.0101
	(0.0691)	(0.0068)
Female	-1.4563***	-0.0073
	(0.5237)	(0.0602)
PhD Top Reputation University	0.4262	0.0657
	(0.4188)	(0.0445)
International PhD	0.9054	-0.0029
	(0.6754)	(0.0652)
Constant	3.8322	1.8402***
	(2.6315)	(0.2601)
p-value for test: *Tenure in the 2000s* = *Tenure in the 2010s*	0.0000***	0.0000***
Observations	781	781
R^2	0.2137	0.3343
Adjusted R^2	0.2014	0.3239
F Statistic	17.3888***	32.1361***

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Table III-5 continued from previous page

Notes: This table reports the results of two OLS regressions. The dependent variables concern the networks of the newly tenured professors and are introduced in Section 3. *# of Different Coauthors* is defined as the number of unique coauthors that the professors collaborated with based on their publications until they obtained their first professorship. *Average # of Authors per Publication* is defined as the average number of coauthors over all publications that the professors have published until they obtained their first tenured professorship. *Tenure in the 2000s* is a dummy variable that equals 1, if a professor obtained the first tenured professorship in the 2000s. *Tenure in the 2010s* is a dummy variable that equals 1, if a professor obtained the first tenured professorship in the 2010s. We control for the field of business economics in which the professors are active that we assign based on the classification provided by Eisend and Schuchert-Güler (2015). Furthermore, we control for *Age at Tenure* (the difference in years between a professor's birth and the year in which the professor obtained the first tenured professorship), *Female* (a dummy variable that equals 1, if a professor is a woman), *PhD Top Reputation University* (a dummy variable that equals 1, if a professor obtained the PhD at university with a particularly high reputation in terms of educating business economics professors), and *International PhD* (a dummy variable that equals 1, if a professor obtained the PhD in any other country than Germany). All models are estimated using heteroscedasticity-robust standard errors. Additionally, we report p-values from Wald F-Tests, which test the equality of coefficients on *Tenure in the 2000s* and *Tenure in the 2010s*. Significance levels are denoted as follows: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$.

Table III-5 displays the results of these OLS regressions. After including the set of control variables, we document a significant increase in both variables that capture the professional networks of the professors. The difference in the number of different coauthors between professors tenured in the 1990s and their peers tenured in the 2000s accounts for 3.24, which is also statistically significant. The difference between professors who received tenure in the 2010s and those who received tenure in the 1990s accounts for 6.92 and is also statistically significant. We document a similar trend for the average number of authors per paper. The difference between professors tenured in the 1990s and the 2000s (0.43) is statistically significant, which also holds true for the difference between professors tenured in the 1990s and the 2010s (0.95). These results are in line with previous literature that documents an increasing importance of scientific collaboration (Acedo et al. 2006; Jones 2021; Wuchty et al. 2007).

Concerning the control variables, our results show that in particular professors in the fields business information systems, marketing, and operations operate in significantly larger professional networks compared to their peers in management, our reference group. Furthermore, we find that women possess smaller professional networks than men, which is in line with previous literature (Ghosh and Liu 2020; McDowell et al. 2006).

4.3 Changin' national focus

Table III-6 reports changes regarding the national focus of the professors in our data, which we test regarding their statistical difference using a series of Bonferroni-adjusted t-tests. Generally, we provide strong evidence regarding a decreasing national focus. More precisely, we document that the mean fraction of papers with a German title in a professor's publication list decreases substantially from 80.26% (1990s) to 29.60% (2010s). The same effect is documented for publications in DACH journals. Professors who obtained tenure in the 1990s published 86.81% of their papers in such journals, whereas the average professors who obtained tenure in the 2010s only published 38.34% of their papers in DACH journals. Additionally, we document that the fraction of papers in traditional German business economics journals decreases from the 1990s (20.64%) to the 2010s (8.93%). However, we find that the fraction of professors who have at least one publication in a traditional German business economics journal when obtaining the first tenured professorship is at a high level and decreases less severely from 67.95% (1990s) to 49.82% (2010s). So, our results show that about one in two professors who obtain tenure in the 2010s published at least once in one of the traditional German business economics journals.[13]

Table III-6: Changin' national focus

	N	Publications with German Title	Publications in DACH Journals	Publications in GBE Journals	At Least One GBE Journal
Total Sample	781	52.80%	62.14%	13.88%	57.87%
[1] Tenure in the 1990s	156	80.26%	86.81%	20.64%	67.95%
[2] Tenure in the 2000s	352	58.61%	69.66%	14.71%	59.66%
[3] Tenure in the 2010s	273	29.60%	38.34%	8.93%	49.82%
Difference [2] – [1]		-21.64%***	-17.15%***	-5.93%***	-8.29%
Difference [3] – [2]		-29.01%***	-31.33%***	-5.78%***	-9.84%**
Difference [3] – [1]		-50.65%***	-48.48%***	-11.70%***	-18.13%***

Continued on next page

[13] Please find the most common journal outlets by the professors dependent on the decade in which they obtained their first tenured professorship in Appendix III-B. Among the most common journal outlets in all three groups, traditional German business economics journals such as the *Journal of Business Economics* rank among the top.

Table III-6 continued from previous page

Notes: This table reports summary statistics regarding the national focus of the newly tenured professors in our total sample (first row). In addition, this table reports summary statistics for the variables regarding the national focus of the newly tenured professors dependent on the decade in which the professors obtained their first tenured professorship (second to fourth row). *Publications with German Title* is defined as the fraction of publications that have a German title in all publications that a professor has published until obtaining the first tenured professorship. *Publications in DACH Journals* is defined as the fraction of publications in journals that originate from one of the three DACH countries in all publications that a professor has published until obtaining the first tenured professorship. *Publications in GBE Journals* is defined as the fraction of publications in traditional German business economics journals in all publications that a professor has published until obtaining the first tenured professorship. *At Least One GBE Journal* is defined as the fraction of professors who have published at least once in a German business economics journals until obtaining the first tenured professorship. Finally, this table reports the differences between the average values of the professors who obtained tenure in the different decades (fifth to seventh row). We apply a series of Bonferroni-adjusted t-tests in order to determine whether the reported differences are statistically significant from each other. Significance levels are denoted as follows: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$.

Next, we estimate a series of OLS/LPM[14] regressions again in order to test whether these results persist if we include a series of control variables. In addition to the controls in our previous model, we also control for the number of different coauthors that a professor collaborated with until he or she did obtain the first tenured professorship. We include this variable, since we assume that professors in our data who collaborate more intensively should publish more internationally since the likelihood that they have international coauthors increases.

[14] As one of our dependent variables (*At Least One GBE Journal*) is a dummy variable, we re-estimate this model as a Logit model. The results remain robust and are available upon request.

Table III-7: Changin' national focus – regressions

Dependent variable:	Publications with German Title	Publications in DACH Journals	Publications in GBE Journals	At Least One GBE Journal
	(1)	(2)	(3)	(4)
Mean left-hand side	0.5280	0.6214	0.1388	0.5787
Tenure in the 2000s	*-0.2120****	*-0.1605****	*-0.0395**	*-0.0612*
	(0.0249)	*(0.0227)*	*(0.0211)*	*(0.0466)*
Tenure in the 2010s	*-0.4598****	*-0.4310****	*-0.0867****	*-0.1886****
	(0.0270)	*(0.0256)*	*(0.0207)*	*(0.0519)*
Accounting	0.1925***	0.2020***	0.0379*	0.1324***
	(0.0272)	(0.0247)	(0.0216)	(0.0498)
BIS	-0.0638	-0.0436	-0.0936***	-0.3300***
	(0.0429)	(0.0402)	(0.0187)	(0.0686)
Finance	-0.0817***	-0.0357	-0.0317	-0.0312
	(0.0313)	(0.0314)	(0.0204)	(0.0567)
Marketing	0.0069	-0.0326	0.0030	0.0914
	(0.0313)	(0.0295)	(0.0216)	(0.0575)
Operations	-0.1221***	-0.1219***	-0.0259	-0.0405
	(0.0315)	(0.0298)	(0.0207)	(0.0586)
Other	0.0219	-0.0122	-0.0724***	-0.1372
	(0.0548)	(0.0488)	(0.0227)	(0.0895)
Age at Tenure	0.0088***	0.0041	-0.0037**	-0.0167***
	(0.0030)	(0.0029)	(0.0017)	(0.0050)
Female	-0.0432	-0.0205	-0.0096	-0.0795*
	(0.0267)	(0.0248)	(0.0164)	(0.0443)
PhD Top Reputation University	0.0155	0.0225	0.0367***	0.0666*
	(0.0196)	(0.0187)	(0.0134)	(0.0348)
International PhD	-0.1640***	-0.2234***	-0.0730***	-0.2052***
	(0.0319)	(0.0317)	(0.0129)	(0.0556)
# of Different Coauthors	-0.0038**	-0.0042***	-0.0033***	0.0061*
	(0.0015)	(0.0014)	(0.0009)	(0.0034)
Constant	0.4943***	0.7257***	0.3533***	1.2595***
	(0.1152)	(0.1096)	(0.0637)	(0.1885)
p-value for test: *Tenure in the 2000s* = *Tenure in the 2010s*	0.0000***	0.0000***	0.0002***	0.0016***
Observations	781	781	781	781
R^2	0.4409	0.4730	0.1408	0.1218
Adjusted R^2	0.4314	0.4641	0.1263	0.1069
F Statistic	46.5223***	52.9512***	9.6722***	8.1797***

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Table III-7 continued from previous page

Notes: This table reports the results of four OLS/LPM regressions. The dependent variables concern the national focus of the newly tenured professors and are introduced in Section 3. *Publications with German Title* is defined as the fraction of publications that have a German title in all publications that a professor has published until obtaining the first tenured professorship. *Publications in DACH Journals* is defined as the fraction of publications in journals that originate from one of the three DACH countries in all publications that a professor has published until obtaining the first tenured professorship. *Publications in GBE Journals* is defined as the fraction of publications in traditional German business economics journals in all publications that a professor has published until obtaining the first tenured professorship. *At Least One GBE Journal* is defined as the fraction of professors who have published at least once in a German business economics journals until obtaining the first tenured professorship. *Tenure in the 2000s* is a dummy variable that equals 1, if a professor obtained the first tenured professorship in the 2000s. *Tenure in the 2010s* is a dummy variable that equals 1, if a professor obtained the first tenured professorship in the 2010s. We control for the field of business economics in which the professors are active that we assign based on the classification provided by Eisend and Schuchert-Güler (2015). Furthermore, we control for *Age at Tenure* (the difference in years between a professor's birth and the year in which the professor obtained the first tenured professorship), *Female* (a dummy variable that equals 1, if a professor is a woman), *PhD Top Reputation University* (a dummy variable that equals 1, if a professor obtained the PhD at university with a particularly high reputation in terms of educating business economics professors), *International PhD* (a dummy variable that equals 1, if a professor obtained the PhD in any other country than Germany), and the *# of Different Coauthors*. All models are estimated using heteroscedasticity-robust standard errors. Additionally, we report p-values from Wald F-Tests, which test the equality of coefficients on *Tenure in the 2000s* and *Tenure in the 2010s*. Significance levels are denoted as follows: *p<0.1; **p<0.05; ***p<0.01.

Table III-7 shows the respective regression results, which corroborate our univariate evidence that the national focus is substantially decreasing. Our regression estimates highlight that the fraction of papers with a German title is significantly lower for professors who obtained tenure in the 2000s (-0.21) and in the 2010s (-0.46) when compared to their peers who received tenure in the 1990s. The same holds true for the fraction of papers in DACH journals, where the regression coefficients indicate differences as large as -0.16 (Tenure in the 2000s) respectively -0.43 (Tenure in the 2010s). Furthermore, we find that the fraction of papers in traditional German business economics journals is also decreasing. Our regression yields differences as large as -0.04 (Tenure in the 2000s) respectively -0.09 (Tenure in the 2010s). Finally, our results also show that the fraction of professors with at least one publication in a German business economics journal is significantly decreasing from the 1990s to the 2010s (-0.19). These results are in line with Buehling (2021) who provides evidence that German-based economics researchers began to focus more on international topics in the late 2000s. Our results are also in line with findings documented in Ayaita et al. (2019) who argue that changes in publication behavior probably result from a focus shift towards publications in highly renowned international journals.

With respect to our control variables, we find that in particular accounting professors publish their work with a stronger national focus compared to management professors, our reference group. In contrast, business information systems professors and operations professors possess a weaker national focus than management professors. Furthermore, we find that professors who obtained their PhD internationally have a weaker national focus when it comes to publishing their work. Finally, professors with larger professional networks as measured by the number of different coauthors also possess a weaker national focus.

4.4 Changin' top publications

Table III-8 reports our univariate findings – based on a series of Bonferroni-adjusted t-tests – in terms of changing publications in highly renowned journals. In general, we document an increasing focus on top publications over time. For example, professors who obtained tenure in the 1990s on average published 0.37 papers (not adjusted for coauthorship) in A journals according to the *JQL3*, which roughly increased fourfold until the 2010s, when professors published 1.58 papers in A journals until they obtained their first tenured professorship. We document a similar pattern, if we focus on the fraction of professors who have published at least one paper in an A journal until they obtain their first tenured professorship. In the 1990s only 17.31% of the professors in our data have at least one such publication, whereas 60.44% of the professors who obtained tenure in the 2010s have published at least one paper in an A journal. Similar effects can be found for publications in A+ journals and FT50 journals. For example, the average professor in the 1990s published 0.08 papers in an FT50 journal. This number increases about tenfold to 0.89 in the 2010s.

Table III-8: Changin' top publications

	N	# Jourqual A	At Least One Jourqual A	# Jourqual A+	At Least One Jourqual A+	# FT50	At Least One FT50
Total Sample	781	0.88	38.54%	0.16	10.11%	0.43	21.64%
[1] Tenure in the 1990s	156	0.37	17.31%	0.06	4.49%	0.08	5.77%
[2] Tenure in the 2000s	352	0.56	30.97%	0.10	7.39%	0.22	14.49%
[3] Tenure in the 2010s	273	1.58	60.44%	0.29	16.85%	0.89	39.93%
Difference [2] – [1]		0.19	13.66%***	0.04	2.90%	0.14	8.72%
Difference [3] – [2]		1.02***	29.47%***	0.19***	9.46%***	0.67***	25.44%***
Difference [3] – [1]		1.20***	43.13%***	0.24***	12.36%***	0.81***	34.16%***

Notes: This table reports summary statistics regarding the top publications of the newly tenured professors in our total sample (first row). In addition, this table reports summary statistics for the variables regarding the top publications of the newly tenured professors dependent on the decade in which the professors obtained their first tenured professorship (second to fourth row). *# Jourqual A* is defined as the number of publications in A journals (according to the *Jourqual 3)* a professor has published until obtaining the first tenured professorship. *At Least One Jourqual A* is defined as the fraction of professors that has published at least once in an A journal (according to the *Jourqual 3*) until obtaining the first tenured professorship. *# Jourqual A+* is the number of publications in A+ journals (according to the *Jourqual 3*) a professor has published until obtaining the first tenured professorship. *At Least One Jourqual A+* is defined as the fraction of professors that has published at least once in an A+ journal (according to the *Jourqual 3*) until obtaining the first tenured professorship. *# FT50* is defined as the number of publications in FT50 journals a professor has published until obtaining the first tenured professorship. *At Least One FT50* is defined as the fraction of professors that has published at least once in an FT50 journal until obtaining the first tenured professorship. Finally, this table reports the differences between the average values of the professors who obtained tenure in the different decades (fifth to seventh row). We apply a series of Bonferroni-adjusted t-tests in order to determine whether the reported differences are statistically significant from each other. Significance levels are denoted as follows: *p<0.1; **p<0.05; ***p<0.01.

To corroborate that these results persist, if we add our set of control variables, we run a series of OLS/LPM regression models, again.[15] We apply the same set of controls as in our previous model.

[15] As three of our dependent variables (*At Least One Jourqual A*, *At Least One Jourqual A+*, and *At Least One FT50*) are dummy variables, we re-estimate our models as Logit models. The results remain robust and are available upon request.

Table III-9: Changin' top publications – regressions

Dependent variable:	# Jourqual A	At Least One Jourqual A	# Jourqual A+	At Least One Jourqual A+	# FT50	At Least One FT50
	(1)	(2)	(3)	(4)	(5)	(6)
Mean left-hand side	0.8758	0.3854	0.1601	0.1011	0.4302	0.2164
Tenure in the 2000s	*0.0459*	*0.1219****	*0.0746***	*0.0472***	*0.1086**	*0.0840****
	(0.1193)	*(0.0415)*	*(0.0365)*	*(0.0240)*	*(0.0601)*	*(0.0288)*
Tenure in the 2010s	*0.7355****	*0.3465****	*0.2446****	*0.1225****	*0.6441****	*0.2984****
	(0.1688)	*(0.0504)*	*(0.0555)*	*(0.0311)*	*(0.1008)*	*(0.0404)*
Accounting	-0.3638***	-0.0997**	0.0142	-0.0077	-0.2229***	-0.1229***
	(0.1210)	(0.0463)	(0.0295)	(0.0221)	(0.0790)	(0.0372)
BIS	-0.0634	-0.0035	0.0629	-0.0163	-0.3438***	-0.1803***
	(0.2527)	(0.0656)	(0.0738)	(0.0325)	(0.1234)	(0.0478)
Finance	0.1068	0.1070**	0.1786**	0.0628*	-0.0560	-0.0491
	(0.1581)	(0.0525)	(0.0701)	(0.0344)	(0.1011)	(0.0448)
Marketing	0.0320	0.1144**	0.3750***	0.2270***	0.2487*	0.1099**
	(0.1633)	(0.0555)	(0.0764)	(0.0468)	(0.1292)	(0.0530)
Operations	0.7026***	0.1564***	0.1074*	0.0348	0.2475	0.0003
	(0.2208)	(0.0565)	(0.0575)	(0.0325)	(0.1606)	(0.0503)
Other	-0.3321**	-0.0682	0.0775	0.0464	-0.0875	-0.0149
	(0.1469)	(0.0722)	(0.0811)	(0.0559)	(0.1308)	(0.0704)
Age at Tenure	-0.0303**	-0.0075	-0.0064	-0.0065**	-0.0076	-0.0046
	(0.0138)	(0.0050)	(0.0048)	(0.0030)	(0.0103)	(0.0044)
Female	-0.1037	-0.0049	-0.0884**	-0.0432	-0.1649	-0.0618
	(0.1280)	(0.0446)	(0.0438)	(0.0281)	(0.1008)	(0.0378)
PhD Top Reputation University	-0.0776	0.0347	0.0658*	0.0345*	0.0862	0.0353
	(0.1000)	(0.0328)	(0.0370)	(0.0206)	(0.0695)	(0.0279)
International PhD	0.0744	0.0237	0.3021***	0.1816***	0.3565***	0.1728***
	(0.1772)	(0.0561)	(0.0854)	(0.0476)	(0.1335)	(0.0528)
# of Different Coauthors	0.0632***	0.0122***	0.0009	0.0012	0.0223**	0.0060**
	(0.0181)	(0.0041)	(0.0028)	(0.0018)	(0.0100)	(0.0029)
Constant	1.3035**	0.3590*	0.1260	0.2003*	0.2565	0.2156
	(0.5359)	(0.1910)	(0.1854)	(0.1127)	(0.3991)	(0.1663)
p-value for test: *Tenure in the 2000s* = *Tenure in the 2010s*	0.0000***	0.0000***	0.0004***	0.0036***	0.0000***	0.0000***
Observations	781	781	781	781	781	781
R^2	0.2297	0.1890	0.1314	0.1453	0.1759	0.1855
Adjusted R^2	0.2166	0.1753	0.1167	0.1308	0.1620	0.1717
F Statistic	17.5918***	13.7495***	8.9289***	10.0295***	12.5953***	13.4352***

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Table III-9 continued from previous page

Notes: This table reports the results of six OLS/LPM regressions. The dependent variables concern the top publications of the newly tenured professors and are introduced in Section 3. *# Jourqual A* is defined as the number of publications in A journals (according to the *Jourqual 3)* a professor has published until obtaining the first tenured professorship. *At Least One Jourqual A* is defined as the fraction of professors that has published at least once in an A journal (according to the *Jourqual 3*) until obtaining the first tenured professorship. *# Jourqual A+* is the number of publications in A+ journals (according to the *Jourqual 3*) a professor has published until obtaining the first tenured professorship. *At Least One Jourqual A+* is defined as the fraction of professors that has published at least once in an A+ journal (according to the *Jourqual 3*) until obtaining the first tenured professorship. *# FT50* is defined as the number of publications in FT50 journals a professor has published until obtaining the first tenured professorship. *At Least One FT50* is defined as the fraction of professors that has published at least once in an FT50 journal until obtaining the first tenured professorship. *Tenure in the 2000s* is a dummy variable that equals 1, if a professor obtained the first tenured professorship in the 2000s. *Tenure in the 2010s* is a dummy variable that equals 1, if a professor obtained the first tenured professorship in the 2010s. We control for the field of business economics in which the professors are active that we assign based on the classification provided by Eisend and Schuchert-Güler (2015). Furthermore, we control for *Age at Tenure* (the difference in years between a professor's birth and the year in which the professor obtained the first tenured professorship), *Female* (a dummy variable that equals 1, if a professor is a woman), *PhD Top Reputation University* (a dummy variable that equals 1, if a professor obtained the PhD at university with a particularly high reputation in terms of educating business economics professors), *International PhD* (a dummy variable that equals 1, if a professor obtained the PhD in any other country than Germany), and the *# of Different Coauthors*. All models are estimated using heteroscedasticity-robust standard errors. Additionally, we report p-values from Wald F-Tests, which test the equality of coefficients on *Tenure in the 2000s* and *Tenure in the 2010s*. Significance levels are denoted as follows: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$.

Table III-9 presents the results from these regression models, which corroborate our univariate evidence. In particular, we find that professors who obtained tenure in the 2000s and 2010s publish significantly more papers in top journals compared to their peers who obtained tenure in the 1990s. For example, we find that professors who obtain their first tenured professorship in the 2010s publish significantly more in A journals (0.74) when compared to their peers who did obtain their first tenured professorship in the 1990s. This result is confirmed, if we focus on the share of professors with at least one publication in those highly renowned journals. Among professors who obtained tenure in the 2000s and the 2010s the fraction with at least one A, A+, or FT50 publication is significantly higher than among professors who obtained tenure in the 1990s. For instance, the fraction of professors with at least one A publication is significantly larger among professors who obtain tenure in the 2000s (about 12 percentage points) and among professors who obtain tenure in the 2010s (about 35 percentage points) as compared to our reference group. These results confirm anecdotal evidence that suggests an increasing focus on publications in highly renowned journals among German business and economics researchers.

With respect to differences in the business economics fields, we find mixed patterns. For example, accounting professors publish less frequently in A journals and FT50 journals

compared to management professors, our reference group. Finance professors publish more (often) in A journals and A+ journals than management professors. Marketing professors publish more (often) in highly renowned journals than management professors in general. Operations professors publish more (often) in A and A+ journals compared to management professors. In addition, our results highlight that professors who obtained their PhD internationally have more top publications than their peers who obtained their PhD in Germany. Furthermore, we find a significantly positive relationship between the size of the professional network and the number of top publications of a professor.

5. Further Analyses

5.1 How did the introduction of the *Jourqual 1* impact publication behavior of business economics professors?

Since our paper implicitly analyzes the effects that the introduction of market-based structures and journal rankings have on the academic job market, the question how the introduction of the first business economics journal ranking in Germany, the *Jourqual 1* (*JQL1*) in 2003, did impact the academic job market is not far to seek. In an ideal setting, one would be able to causally investigate this question. Yet, in order to do so, one would need an adequate control group, i.e. researchers who are not affected by the introduction of this ranking (e.g., business economics professors who did obtain their first tenured professorship in the Netherlands or France). However, our data does not allow for such an analysis. Nevertheless, in this section, we intend to provide some initial – yet by no means causal – evidence on how the introduction of the *JQL1* might have impacted the academic job market in Germany.

Based on our sample, we build a sub-sample of those professors who did obtain tenure until 2008, i.e. the year of the introduction of *Jourqual 2*. This sub-sample consists of 465 professors. For these professors, and based on the *JQL1*, we define four additional variables. First, we calculate the number of publications in A journals (*# Jourqual 1 A*), of each

professor until obtaining the first tenured professorship. Second, we define a dummy variable that equals 1, if a professor has at least one such publication until he or she did obtain the first tenured professorship. Based on this dummy, we calculate the fraction of professors with *At Least One Jourqual 1 A* publication. We do similar calculations based on publications in A+ journals. We make use of these four variables in four regression models as the left-hand side variables. Our variable of interest is a newly defined dummy variable *Tenure Post JQL1*, which equals 1, if a professor did obtain the first tenured professorship between 2004 and 2008. Additionally, we control for the same set of control variables as in the previous section.

Table III-10: The effect of the introduction of *Jourqual 1* for professors tenured until 2008

Dependent variable:	# Jourqual 1 A	At Least One Jourqual 1 A	# Jourqual 1 A+	At Least One Jourqual 1 A+
	(2)	(3)	(4)	(5)
Mean left-hand side	0.5333	0.2667	0.0989	0.0710
Tenure Post JQL1	*0.1992*	*0.1624****	*0.0405*	*0.0205*
	(0.1243)	*(0.0453)*	*(0.0418)*	*(0.0263)*
Controls	Yes	Yes	Yes	Yes
Observations	465	465	465	465
R^2	0.0750	0.0864	0.0972	0.1106
Adjusted R^2	0.0504	0.0622	0.0732	0.0870
F Statistic	3.0541***	3.5625***	4.0561***	4.6824***

Notes: This table reports the results of four OLS/LPM regressions. The dependent variables concern the reaction of the newly tenured professors to the introduction of *Jourqual 1* and are introduced in Section 5.1. *# Jourqual 1 A* is defined as the number of publications in A journals (according to the *Jourqual 1)* a professor has published until obtaining the first tenured professorship. *At Least One Jourqual 1 A* is defined as the fraction of professors that has published at least once in an A journal (according to the *Jourqual 1*) until obtaining the first tenured professorship. *# Jourqual 1 A+* is the number of publications in A+ journals (according to the *Jourqual 1*) a professor has published until obtaining the first tenured professorship. *At Least One Jourqual 1 A+* is defined as the fraction of professors that has published at least once in an A+ journal (according to the *Jourqual 1*) until obtaining the first tenured professorship. *Tenure Post Jourqual 1* is a dummy variable that equals 1, if a professor obtained the first tenured professorship between 2004 and 2008. We control for the field of business economics in which the professors are active that we assign based on the classification provided by Eisend and Schuchert-Güler (2015). Furthermore, we control for *Age at Tenure* (the difference in years between a professor's birth and the year in which the professor obtained the first tenured professorship), *Female* (a dummy variable that equals 1, if a professor is a woman), *PhD Top Reputation University* (a dummy variable that equals 1, if a professor obtained the PhD at university with a particularly high reputation in terms of educating business economics professors), *International PhD* (a dummy variable that equals 1, if a professor obtained the PhD in any other country than Germany), and the *# of Different Coauthors*. All models are estimated using heteroscedasticity-robust standard errors. Significance levels are denoted as follows: *p<0.1; **p<0.05; ***p<0.01.

Table III-10 presents the respective results. Our analyses yield that the fraction of professors who publish at least once in an A journal according to the *JQL1* before obtaining the first tenured professorship increases significantly. The magnitude of the coefficient equals 0.16, which is also economically meaningful given that only about 27% of the professors in our sub-sample did publish at least once in an A journal according to the *JQL1*. With respect to all our other three dependent variables our regressions yield no significant differences (even though the coefficient sizes are economically meaningful) between professors who did obtain their first tenured professorship after the introduction of the *JQL1* as compared to professors who did obtain their first tenured professorship before.

In summary, our analyses suggest that the introduction of the *JQL1* did impact the academic job market in German business economics at least to some extent. However, since our results lack causality they should be interpreted carefully. Nevertheless, there is causal evidence by Buehling (2021) who shows that the introduction of the *Handelsblatt* ranking in Germany did cause German economists to shift their research topics. Hence, we would expect that the introduction of the *JQL1* also did impact German business economics.

5.2 Departmental heterogeneity

Another factor that could impact our results might be the heterogeneity of university departments. For example, some of our results might be caused by the fact that particular renowned university departments have different standards or selection criteria than less renowned universities. In order to account for that possibility, we follow Clermont (2016) and define the following universities as particular renowned regarding their business economics departments: Free University of Berlin, Humboldt University of Berlin, Goethe University Frankfurt, Kiel University, University of Mannheim, Ludwig Maximilian University of Munich, Technical University of Munich, University of Münster, WHU – Otto Beisheim School of Management. Based on this list, we define a dummy variable called *Tenure at Renowned University* that equals 1, if a professor in our sample obtains

the first tenured professorship at one of these universities. We re-estimate all our regression models adding this dummy variable.

Table III-11 displays the results. We find that all our main findings are robust to the inclusion of this new dummy variable. In other words, our findings do not appear to be driven by the heterogeneity in reputation across university departments. Apart from that, these analyses yield further insightful results. For example, we find that professors who obtain tenure at such a renowned university on average are younger, less likely to be a woman, less likely to have obtained their PhD at a university with a high reputation, and more likely to have received their PhD internationally. Additionally, we find that professors who obtain tenure at a renowned university possess larger networks as measured by both our variables. Regarding the national focus, we find that these professors publish less often with German titles and less often in DACH journals. Finally, we find that professors who obtain their first tenured professorship at a renowned university have more publications in highly renowned international journal, i.e. more publications in A, A+, and FT50 journals.

Table III-11: University heterogeneity regarding reputation

Panel A: Changin' characteristics					
Dependent variable:	Age at Tenure	Female	PhD Top Reputation University	International PhD	Same University Graduation and PhD
	(1)	(2)	(3)	(4)	(5)
Mean left-hand side	37.1076	0.1690	0.4110	0.1127	0.5749
Tenure in the 2000s	1.4131***	0.0597**	-0.0787*	0.0093	-0.2192***
	(0.2828)	(0.0301)	(0.0477)	(0.0272)	(0.0447)
Tenure in the 2010s	0.4542	0.1476***	-0.0078	0.0421	-0.1706***
	(0.3154)	(0.0349)	(0.0500)	(0.0302)	(0.0469)
Tenure at Renowned University	*-1.2352****	*-0.0567**	*-0.0768**	*0.1249****	*-0.0614*
	(0.2895)	*(0.0334)*	*(0.0454)*	*(0.0377)*	*(0.0471)*
Controls	Yes	Yes	Yes	Yes	Yes
Observations	781	781	781	781	781
R^2	0.0678	0.0444	0.0488	0.0464	0.0465
Adjusted R^2	0.0569	0.0332	0.0377	0.0353	0.0354
F Statistic	6.2282***	3.9759***	4.3957***	4.1683***	4.1801***

Panel B: Changin' networks		
Dependent variable:	# of Different Coauthors	Average # of Authors per Publication
	(1)	(2)
Mean left-hand side	6.9923	2.0741
Tenure in the 2000s	3.0767***	0.4145***
	(0.4410)	(0.0544)
Tenure in the 2010s	6.7939***	0.9445***
	(0.5429)	(0.0587)
Tenure at Renowned University	*1.4056***	*0.1156**
	(0.6016)	*(0.0593)*
Controls	Yes	Yes
Observations	781	781
R^2	0.2195	0.3377
Adjusted R^2	0.2063	0.3265
F Statistic	16.5912***	30.0855***

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Table III-11 continued from previous page

Panel C: Changin' national focus

Dependent variable:	Publications with German Title	Publications in DACH Journals	Publications in GBE Journals	At Least One GBE Journal
	(1)	(2)	(3)	(4)
Mean left-hand side	0.5280	0.6214	0.1388	0.5787
Tenure in the 2000s	-0.2067***	-0.1548***	-0.0409*	-0.0559
	(0.0248)	(0.0228)	(0.0212)	(0.0470)
Tenure in the 2010s	-0.4570***	-0.4279***	-0.0874***	-0.1858***
	(0.0270)	(0.0258)	(0.0208)	(0.0521)
Tenure at Renowned University	*-0.0532***	*-0.0572***	*0.0135*	*-0.0530*
	(0.0238)	*(0.0223)*	*(0.0147)*	*(0.0444)*
Controls	Yes	Yes	Yes	Yes
Observations	781	781	781	781
R^2	0.4439	0.4767	0.1415	0.1232
Adjusted R^2	0.4337	0.4671	0.1258	0.1072
F Statistic	43.6743***	49.8330***	9.0181***	7.6895***

Panel D: Changin' top publications

Dependent variable:	# Jourqual A	At Least One Jourqual A	# Jourqual A+	At Least One Jourqual A+	# FT50	At Least One FT50
	(1)	(2)	(3)	(4)	(5)	(6)
Mean left-hand side	0.8758	0.3854	0.1601	0.1011	0.4302	0.2164
Tenure in the 2000s	0.0197	0.1187***	0.0449	0.0301	0.0572	0.0679**
	(0.1176)	(0.0415)	(0.0368)	(0.0237)	(0.0624)	(0.0286)
Tenure in the 2010s	0.7214***	0.3449***	0.2286***	0.1133***	0.6165***	0.2897***
	(0.1679)	(0.0502)	(0.0534)	(0.0303)	(0.0988)	(0.0398)
Tenure at Renowned University	*0.2616**	*0.0312*	*0.2968****	*0.1706****	*0.5137***	*0.1610****
	(0.1548)	*(0.0442)*	*(0.0752)*	*(0.0373)*	*(0.1374)*	*(0.0425)*
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	781	781	781	781	781	781
R^2	0.2333	0.1895	0.1703	0.1859	0.2062	0.2049
Adjusted R^2	0.2193	0.1747	0.1551	0.1711	0.1917	0.1904
F Statistic	16.6471***	12.7941***	11.2286***	12.4976***	14.2100***	14.0998***

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Table III-11 continued from previous page

Notes: This table reports the results of seventeen OLS/LPM regressions. The dependent variables are similar to those that we used in our main analyses and are introduced in Section 3. *Tenure in the 2000s* is a dummy variable that equals 1, if a professor obtained the first tenured professorship in the 2000s. *Tenure in the 2010s* is a dummy variable that equals 1, if a professor obtained the first tenured professorship in the 2010s. *Tenure at Renowned University* is a dummy variable that equals 1, if a professor obtained the first tenured professorship at one of the renowned business economics universities as defined by Clermont (2016). We control for the field of business economics in which the professors are active that we assign based on the classification provided by Eisend and Schuchert-Güler (2015). Furthermore, we control for *Age at Tenure* (the difference in years between a professor's birth and the year in which the professor obtained the first tenured professorship), *Female* (a dummy variable that equals 1, if a professor is a woman), *PhD Top Reputation University* (a dummy variable that equals 1, if a professor obtained the PhD at university with a particularly high reputation in terms of educating business economics professors), *International PhD* (a dummy variable that equals 1, if a professor obtained the PhD in any other country than Germany), and the *# of Different Coauthors*. All models are estimated using heteroscedasticity-robust standard errors. Significance levels are denoted as follows: *p<0.1; **p<0.05; ***p<0.01.

In an additional analysis, we also investigate into the heterogeneity in size of the appointing department. To do so, we rank the university departments in our data based on the number of tenured professors in our sample. The following ten institutions – in no particular order – employ the most professors: University of Hamburg, WHU – Otto Beisheim School of Management, University of Mannheim, University of Cologne, Goethe University Frankfurt, Ludwig Maximilian University of Munich, University of Bayreuth, University of Duisburg-Essen, Frankfurt School of Finance & Management, and University of Erlangen–Nuremberg. Based on this list, we define a dummy variable called *Tenure at Large University* that equals 1, if a professor in our sample obtains the first tenured professorship at one of these universities. Again, we re-estimate all our regression models adding this dummy variable.

Table III-12: University heterogeneity regarding size

Panel A: Changin' characteristics

Dependent variable:	Age at Tenure	Female	PhD Top Reputation University	International PhD	Same University Graduation and PhD
	(1)	(2)	(3)	(4)	(5)
Mean left-hand side	37.1076	0.1690	0.4110	0.1127	0.5749
Tenure in the 2000s	1.3257***	0.0562*	-0.0881*	0.0208	-0.2241***
	(0.2831)	(0.0298)	(0.0476)	(0.0274)	(0.0445)
Tenure in the 2010s	0.4269	0.1475***	-0.0177	0.0504*	-0.1732***
	(0.3123)	(0.0351)	(0.0500)	(0.0303)	(0.0469)
Tenure at Large University	*-0.7015*** (0.3056)*	*-0.0425 (0.0311)*	*0.0304 (0.0421)*	*0.0209 (0.0287)*	*-0.0234 (0.0421)*
Controls	Yes	Yes	Yes	Yes	Yes
Observations	781	781	781	781	781
R^2	0.0570	0.0434	0.0462	0.0262	0.0448
Adjusted R^2	0.0460	0.0323	0.0350	0.0148	0.0337
F Statistic	5.1815***	3.8903***	4.1478***	2.3053**	4.0206***

Panel B: Changin' networks

Dependent variable:	# of Different Coauthors	Average # of Authors per Publication
	(1)	(2)
Mean left-hand side	6.9923	2.0741
Tenure in the 2000s	3.1235***	0.4183***
	(0.4478)	(0.0544)
Tenure in the 2010s	6.7228***	0.9385***
	(0.5193)	(0.0587)
Tenure at Large University	*1.6268** (0.6583)*	*0.1343*** (0.0515)*
Controls	Yes	Yes
Observations	781	781
R^2	0.2238	0.3403
Adjusted R^2	0.2106	0.3291
F Statistic	17.0111***	30.4357***

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Table III-12 continued from previous page

Panel C: Changin' national focus

Dependent variable:	Publications with German Title	Publications in DACH Journals	Publications in GBE Journals	At Least One GBE Journal
	(1)	(2)	(3)	(4)
Mean left-hand side	0.5280	0.6214	0.1388	0.5787
Tenure in the 2000s	-0.2102***	-0.1588***	-0.0388*	-0.0578
	(0.0249)	(0.0227)	(0.0211)	(0.0465)
Tenure in the 2010s	-0.4572***	-0.4286***	-0.0856***	-0.1837***
	(0.0271)	(0.0258)	(0.0207)	(0.0520)
Tenure at Large University	*-0.0395**	*-0.0355*	*-0.0162*	*-0.0738**
	(0.0217)	*(0.0216)*	*(0.0131)*	*(0.0418)*
Controls	Yes	Yes	Yes	Yes
Observations	781	781	781	781
R^2	0.4430	0.4748	0.1421	0.1254
Adjusted R^2	0.4329	0.4652	0.1264	0.1094
F Statistic	43.5213***	49.4668***	9.0598***	7.8467***

Panel D: Changin' top publications

Dependent variable:	# Jourqual A	At Least One Jourqual A	# Jourqual A+	At Least One Jourqual A+	# FT50	At Least One FT50
	(1)	(2)	(3)	(4)	(5)	(6)
Mean left-hand side	0.8758	0.3854	0.1601	0.1011	0.4302	0.2164
Tenure in the 2000s	0.0424	0.1204***	0.0662*	0.0412*	0.0971	0.0793***
	(0.1190)	(0.0416)	(0.0364)	(0.0237)	(0.0604)	(0.0288)
Tenure in the 2010s	0.7305***	0.3444***	0.2326***	0.1140***	0.6277***	0.2916***
	(0.1700)	(0.0506)	(0.0547)	(0.0308)	(0.1003)	(0.0404)
Tenure at Large University	*0.0743*	*0.0316*	*0.1790****	*0.1270****	*0.2447***	*0.1010****
	(0.1269)	*(0.0405)*	*(0.0556)*	*(0.0310)*	*(0.1045)*	*(0.0360)*
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	781	781	781	781	781	781
R^2	0.2301	0.1897	0.1497	0.1744	0.1848	0.1953
Adjusted R^2	0.2160	0.1749	0.1341	0.1593	0.1699	0.1806
F Statistic	16.3485***	12.8084***	9.6307***	11.5578***	12.4019***	13.2827***

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Table II-12 continued from previous page

Notes: This table reports the results of seventeen OLS/LPM regressions. The dependent variables are similar to those that we used in our main analyses and are introduced in Section 3. *Tenure in the 2000s* is a dummy variable that equals 1, if a professor obtained the first tenured professorship in the 2000s. *Tenure in the 2010s* is a dummy variable that equals 1, if a professor obtained the first tenured professorship in the 2010s. *Tenure at Large University* is a dummy variable that equals 1, if a professor obtained the first tenured professorship at one of the ten largest business economics universities in our data. We control for the field of business economics in which the professors are active that we assign based on the classification provided by Eisend and Schuchert-Güler (2015). Furthermore, we control for *Age at Tenure* (the difference in years between a professor's birth and the year in which the professor obtained the first tenured professorship), *Female* (a dummy variable that equals 1, if a professor is a woman), *PhD Top Reputation University* (a dummy variable that equals 1, if a professor obtained the PhD at university with a particularly high reputation in terms of educating business economics professors), *International PhD* (a dummy variable that equals 1, if a professor obtained the PhD in any other country than Germany), and the *# of Different Coauthors*. All models are estimated using heteroscedasticity-robust standard errors. Significance levels are denoted as follows: *p<0.1; **p<0.05; ***p<0.01.

Table III-12 displays the results. Again, we find that all our main findings are robust to the inclusion of this new dummy variable. In other words, our findings do not appear to be driven by the heterogeneity in size across university departments. Beyond that, these analyses yield further insightful results. For example, we find that professors who obtain tenure at a large university, on average, are younger and possess larger networks as measured by both our variables. Regarding the national focus, we find that these professors publish less often with German titles and less often in GBE journals. Finally, we find that professors who obtain their first tenured professorship at a large university have more publications in very renowned international journal, i.e. more publications in A+ and FT50 journals.

6. Discussion

Summary of results

Based on our unique, hand-collected data set, our study documents that the profiles of newly tenured business economics professors in Germany did change in multiple ways over the past thirty years. We document significant changes with regard to the professors' general characteristics, their professional networks, their national focus, and their focus on top publications. Our results are generally in line with previous literature and anecdotal evidence as we document that business economics researchers become more diverse (i.e., in

terms of their gender, the internationality of their education, or their mobility), build larger professional networks, conduct their research with a stronger international focus, and publish more frequently in highly renowned international journals. Particularly our finding that German business economics professors publish more frequently in highly renowned international journals allows to draw conclusion regarding the development regarding tenure requirements over time, at least implicitly.

Limitations

Our work is not without limitations of course. For instance, our data set is based on CV data, which is publicly available on the internet and thus made available by the professors themselves. The lack of obligation and common standards to report CV information contains a potential selection bias. Professors who are more successful – compared with less successful professors – might share more information about themselves online.

A second limitation of our approach is that we only capture those professors who are still active in the German university system at the end of 2018, the date of the initial compilation of our dataset. Thus, we cover a higher fraction of newly appointed professors for the recent years of our three-decade investigation period. For example, it might be possible that two professors did obtain their first tenured position in 1990 at the same university and one of them still works there (we capture this person). The other one is not part of the German university system anymore for various reasons (e.g., emeritus status, left Germany, or deceased), and we cannot capture this person using our approach. Unfortunately, we cannot precisely calculate the likelihood of such events but there are reasons to believe (e.g., high level of job satisfaction, cohesive job market) that not many business economics professors should leave the German university system.

Third, we have no information about all postdoctoral researchers who aim to become a tenured professor. Hence, we cannot control for competition in the job market. However, the number of applicants per tenured professorship could influence our results. Anecdotal evidence suggests that there have been more applicants for each professorship in the 2010s compared to the 1990s. In this period, due to the German unification, a large number of

newly created professorships in the eastern part of Germany was probably associated with less harsh competition for tenured professorships. Since the 2000s, higher job market competition would have caused professors to have stronger publication records at the time they are tenured. Yet, to the best of our knowledge there is no empirical evidence on that matter and might be addressed by future research.

Finally, our findings might not be generalizable to different country contexts or different academic disciplines. For example, Backes-Gellner and Schlinghoff (2010) elaborate on differences in the incentive structure between the (traditional) German system and the U.S. system. In this context, they also find differences regarding the publication output in different career phases between researchers located in Germany and those located in the U.S. Additionally, Auranen and Nieminen (2010) show that the university funding system in Germany differs from those in other countries, which might as well be detrimental to the generalizability of our findings to different country contexts. Regarding the generalizability to different academic disciplines, prior research highlights that different tenure standards appear to apply in different academic fields such as sociology (Lutter and Schröder 2016), psychology (Lutter et al. 2022), or political science (Schröder et al. 2021). Hence, we assume that our findings might not be transferable to other academic fields without further ado.

Implications for research

Even though we do not provide any causal evidence, we believe that the documented changes are related to changes in the economic incentives for junior researchers caused by NPM (Schmoch and Schubert 2010; Schubert 2009) and the introduction of journal rankings (Buehling 2021; Vogel et al. 2017). Part of these changes has been the use of performance-based indicators at universities in order to allocate funds or to make tenure decisions based on the research outputs of professors respectively junior researchers (Rabovsky 2014). Schubert (2009) for example, documents that these reforms actually increase research efficiency of German research units. Additionally, Ayaita et al. (2019) link their finding that younger researchers rely more heavily on journal publications than their predecessors to the reforms associated with NPM. Our results add to this literature

by highlighting additional changes in the profiles of newly tenured business economics professors who have been exposed to these reforms. Furthermore, our analyses regarding the introduction of the *JQL1* intend to provide further insights into the question how the introduction of journal rankings did affect business economics researchers.

Our paper also adds to the discussion regarding the intended and unintended effects of the use of personal and journal rankings (Osterloh and Frey 2015; Rost and Frey 2011). On the one hand, critics of such rankings argue that these rankings lead to less creativity and diversity in research. While our paper provides no direct evidence to support this claim, our results indicate that German business economics professors indeed converge towards international research outlets, which ultimately might result in less creativity and diversity in terms of their research. On the other hand, we find that German business economics researchers become increasingly internationally competitive. This competitiveness is intended by policymakers in Germany, who, for example, initiated the so-called excellence initiative in order to make the German university system internationally more competitive (Civera et al. 2020; Menter et al. 2018).

Implications for practice

First, we provide guidance for postdoctoral researchers striving for a tenured professorship. The present paper displays the standards concerning the publication records of newly tenured professors in German business economics, which helps young researchers to identify the requirements they have to accomplish. Furthermore, our paper allows to draw conclusions regarding other aspects like international visits or professional networks that might help to obtain the tenured professorship. In particular, our results highlight the growing importance to publish in larger coauthor networks. This might, among other aspects, be caused by the fact that hiring committees typically do not account for the number of coauthors when assessing a researcher's publication portfolio. Second, we provide information for hiring committees that must assess the achievements of researchers who apply for a tenured professorship as our paper contains several benchmarks on that matter.

Finally, our paper contains important practical implications regarding the publication strategy of junior researchers in German business economics. Despite the decreasing focus

on traditional German business economics journals, the fact that roughly 50% of the professors who obtained tenure in the 2010s published at least once in such a journal, highlights the relevance of these journals for today's business economics researchers. The persisting relevance of traditional German business economics journals becomes tangible when looking at the most common journal outlets in which the professors in our sample publish before obtaining tenure (Appendix III-B). Our results show that the traditional German business economics journals are persistently among the most common journal outlets, also in the most recent decade. We find that junior business economics researchers still find it attractive to publish in "general interest" journals such as the *Journal of Business Economics* or the *Schmalenbach Business Review* (now the *Schmalenbach Journal of Business Research*). Publishing in these journals guarantees a broad readership and also might allow for more creativity and diversity in research themes.

7. References

Acedo, Francisco J., Carmen Barroso, Cristóbal Casanueva, and José L. Galán. 2006. Co-Authorship in Management and Organizational Studies: An Empirical and Network Analysis. *Journal of Management Studies* 43 (5): 957–983.

Ambrasat, Jens, and Jakob Tesch. 2017. Structured Diversity – The changing landscape of doctoral training in Germany after the introduction of structured doctoral programs. *Research Evaluation* 26 (4): 292–301.

Auranen, Otto, and Mika Nieminen. 2010. University research funding and publication performance—An international comparison. *Research Policy* 39 (6): 822–834.

Ayaita, Adam, Kerstin Pull, and Uschi Backes-Gellner. 2019. You get what you 'pay' for: academic attention, career incentives and changes in publication portfolios of business and economics researchers. *Journal of Business Economics* 89 (3): 273–290.

Backes-Gellner, Uschi, Agnes Bäker, and Kerstin Pull. 2018. The opportunity costs of becoming a dean: Does leadership in academia crowd out research? *Schmalenbach Business Review* 70 (2): 189–208.

Backes-Gellner, Uschi, and Axel Schlinghoff. 2010. Career Incentives and "Publish or Perish" in German and U.S. Universities. *European Education* 42 (3): 26–52.

Bajo, Emanuele, Massimiliano Barbi, and David Hillier. 2020. Where should I publish to get promoted? A finance journal ranking based on business school promotions. *Journal of Banking & Finance* 114.

Bäker, Agnes. 2015. Non-tenured postdoctoral researchers' job mobility and research output: An analysis of the role of research discipline, department size, and coauthors. *Research Policy* 44 (3): 634–650.

Bäker, Agnes, Susanne Breuninger, Julia Muschallik, Kerstin Pull, and Uschi Backes-Gellner. 2016. Time to Go?

(Inter)National Mobility and Appointment Success of Young Academics. *Schmalenbach Business Review* 17 (3-4): 401–421.

Bäker, Agnes, Susanne Breuninger, and Kerstin Pull. 2021. Pushing performance by building bridges: Human and social capital as mechanisms behind the mobility-performance link. *Journal of Vocational Behavior* 129: 103613.

Beattie, Vivien, and Alan Goodacre. 2012. Publication records of accounting and finance faculty promoted to professor: evidence from the UK. *Accounting and Business Research* 42 (2): 197–231.

Beckmann, Klaus, and Andrea Schneider. 2013. The interaction of publications and appointments: new evidence on academic economists in Germany. *Education Economics* 21 (4): 415–430.

Bordons, María, Javier Aparicio, Borja González-Albo, and Adrián A. Díaz-Faes. 2015. The relationship between the research performance of scientists and their position in co-authorship networks in three fields. *Journal of Informetrics* 9 (1): 135–144.

Buehling, Kilian. 2021. Changing research topic trends as an effect of publication rankings - The case of German economists and the Handelsblatt Ranking. *Journal of Informetrics* 15 (3).

Civera, Alice, Erik E. Lehmann, Stefano Paleari, and Sarah A. Stockinger. 2020. Higher education policy: Why hope for quality when rewarding quantity? *Research Policy* 49 (8): 104083.

Clermont, Marcel. 2016. Effectiveness and efficiency of research in Germany over time: an analysis of German business schools between 2001 and 2009. *Scientometrics* 108 (3): 1347–1381.

Combes, Pierre-Philippe, and Laurent Linnemer. 2003. Where are the economists who publish? Publication concentration and rankings in Europe based on cumulative publications. *Journal of the European Economic Association* 1 (6): 1250–1308.

Dean, Douglas L., Paul B. Lowry, and Sean Humpherys. 2011. Profiling the

Research Productivity of Tenured Information Systems Faculty at U.S. Institutions. *MIS Quarterly* 35 (1): 1–15.

Dennis, Alan R., Joseph S. Valacich, Mark A. Fuller, and Christoph Schneider. 2006. Research Standards for Promotion and Tenure in Information Systems. *MIS Quarterly* 30 (1): 1–12.

Eisend, Martin, and Susanne Schmidt. 2014. The influence of knowledge-based resources and business scholars' internationalization strategies on research performance. *Research Policy* 43 (1): 48–59.

Eisend, Martin, and Pakize Schuchert-Güler. 2015. Journal publication success of German business researchers: does gender composition and internationality of the author team matter? *Business Research* 8 (2): 171–188.

Essen, Emma von, and Nina Smith. 2022. Network Connections and Board Seats: Are Female Networks Less Valuable? *Journal of Labor Economics*.

Fabel, Oliver, Miriam Hein, and Robert Hofmeister. 2008. Research Productivity in Business Economics: An Investigation of Austrian, German and Swiss Universities. *German Economic Review* 9 (4): 506–531.

Fassin, Yves. 2021. Does the Financial Times FT50 journal list select the best management and economics journals? *Scientometrics* 126 (7): 5911–5943.

Fiedler, Marina, and Isabell M. Welpe. 2008. "If you don't know what port you are sailing to, no wind is favorable" - Appointment Preferences Of Management Professors. *Schmalenbach Business Review* 60 (1): 4–31.

Fitzenberger, Bernd, and Ute Schulze. 2014. Up or Out: Research Incentives and Career Prospects of Postdocs in Germany. *German Economic Review* 15 (2): 287–328.

Ghosh, Pallab, and Zexuan Liu. 2020. Co-authorship and the gender gap in top economics journal publications. *Applied Economics Letters* 27 (7): 580–590.

Glover, Steven M., Douglas F. Prawitt, Scott L. Summers, and David A.

Wood. 2012. Publication Benchmarking Data Based on Faculty Promoted at the Top 75 U.S. Accounting Research Institutions. *Issues in Accounting Education* 27 (3): 647–670.

Glover, Steven M., Douglas F. Prawitt, and David A. Wood. 2006. Publication records of faculty promoted at the top 75 accounting research programs. *Issues in Accounting Education* 21 (3): 195–218.

Gonzalez-Brambila, Claudia N., Francisco M. Veloso, and David Krackhardt. 2013. The impact of network embeddedness on research output. *Research Policy* 42 (9): 1555–1567.

Goodacre, Alan, Clive Gaunt, and Darren Henry. 2021. Publication records of Australian accounting and finance faculty promoted to full professor, set within an international context. *Accounting & Finance* 61 (2): 3089–3133.

Graber, Michael, Andrey Launov, and Klaus Wälde. 2008. Publish or perish? The increasing importance of publications for prospective economics professors in Austria, Germany and Switzerland. *German Economic Review* 9 (4): 457–472.

Hamann, Julian. 2019. The making of professors. Assessment and recognition in academic recruitment. *Social Studies of Science* 49 (6): 919–941.

Heckman, James J., and Sidharth Moktan. 2020. Publishing and promotion in economics: The tyranny of the top five. *Journal of Economic Literature* 58 (2): 419–470.

Hicks, Diana. 2012. Performance-based funding for public research in tertiary education institutions. *Research Policy* 41 (2): 251–261.

Hilber, Simon, Jan-Egbert Sturm, and Heinrich W. Ursprung. 2021. Frauenanteil und geschlechtsspezifische Produktivitätsunterschiede in der volkswirtschaftlichen Forschung. *Perspektiven der Wirtschaftspolitik* 22 (2): 156–171.

Hüther, Otto, and Georg Krücken. 2018. Research on Actors and Groups of Actors at Higher Education Institutions. In *Higher Education in Germany--Recent Developments in an International Perspective*, 177–222.

Cham: Springer International Publishing.

Joecks, Jasmin, Kerstin Pull, and Uschi Backes-Gellner. 2014. Childbearing and (female) research productivity: a personnel economics perspective on the leaky pipeline. *Journal of Business Economics* 84 (4): 517–530.

Jones, Benjamin F. 2021. The Rise of Research Teams: Benefits and Costs in Economics. *Journal of Economic Perspectives* 35 (2): 191–216.

Li, Eldon Y., Chien H. Liao, and Hsiuju R. Yen. 2013. Co-authorship networks and research impact: A social capital perspective. *Research Policy* 42 (9): 1515–1530.

Lorenz, Daniela, and Andreas Löffler. 2015. Robustness of personal rankings: the Handelsblatt example. *Business Research* 8 (2): 189–212.

Lutter, Mark, Isabel M. Habicht, and Martin Schröder. 2022. Gender differences in the determinants of becoming a professor in Germany. An event history analysis of academic psychologists from 1980 to 2019. *Research Policy* 51 (6).

Lutter, Mark, and Martin Schröder. 2016. Who becomes a tenured professor, and why? Panel data evidence from German sociology, 1980–2013. *Research Policy* 45 (5): 999–1013.

McCarty, Christopher, James W. Jawitz, Allison Hopkins, and Alex Goldman. 2013. Predicting author h-index using characteristics of the co-author network. *Scientometrics* 96 (2): 467–483.

McDowell, John M., Larry D. Singell, and Mark Stater. 2006. Two to Tango? Gender Differences in the Decisions to Publish and Coauthor. *Economic Inquiry* 44 (1): 153–168.

Menter, Matthias, Erik E. Lehmann, and Torben Klarl. 2018. In search of excellence: a case study of the first excellence initiative of Germany. *Journal of Business Economics* 88 (9): 1105–1132.

Ooms, Jeroen. 2018. *cld2: Google's compact language detector 2 (Version 1.2.1)*.

Osterloh, Margit, and Bruno S. Frey. 2015. Ranking games. *Evaluation Review* 39 (1): 102–129.

Rabovsky, Thomas M. 2014. Using Data to Manage for Performance at Public Universities. *Public Administration Review* 74 (2): 260–272.

Rapp, David J., Michael Olbrich, and Florian Follert. 2019. Zur Internationalisierung der Rechnungswesenforschung im deutschen Sprachraum – eine Analyse von AAA- und EAA-Jahreskonferenzen 1998–2015. *Schmalenbachs Zeitschrift für betriebswirtschaftliche Forschung* 71 (1): 79–105.

Rauber, Michael, and Heinrich W. Ursprung. 2008. Life Cycle and Cohort Productivity in Economic Research: The Case of Germany. *German Economic Review* 9 (4): 431–456.

Röbken, Heinke. 2009. Career Paths of German Business Administration Academics. *German Journal of Human Resource Management* 23 (3): 219–236.

Rost, Katja, and Bruno S. Frey. 2011. Quantitative And Qualitative Rankings of Scholars. *Schmalenbach Business Review* 63: 63–91.

Schmoch, Ulrich, and Torben Schubert. 2010. Strategic steering of research by new public management in German universities: a looming state–science conflict? *Research Evaluation* 19 (3): 209–216.

Schröder, Martin, Mark Lutter, and Isabel M. Habicht. 2021. Publishing, signaling, social capital, and gender: Determinants of becoming a tenured professor in German political science. *PloS one* 16 (1).

Schubert, Torben. 2009. Empirical observations on New Public Management to increase efficiency in public research—Boon or bane? *Research Policy* 38 (8): 1225–1234.

Schulze, Günther G., Susanne Warning, and Christian Wiermann. 2008. What and How Long Does It Take to Get Tenure? The Case of Economics and Business Administration in Austria, Germany and Switzerland. *German Economic Review* 9 (4): 473–505.

Seeber, Marco, and Jelle Mampaey. 2022. How do university systems' features affect academic inbreeding? Career rules and language requirements in France, Germany, Italy and Spain.

Higher Education Quarterly 76 (1): 20–35.

Sieweke, Jost, Johannes Muck, Stefan Süß, and Justus Haucap. 2014. Forschungsevaluation an Universitäten - Ergebnisse einer explorativen Studie rechts- und wirtschaftswissenschaftlicher Fakultäten. *Schmalenbachs Zeitschrift für betriebswirtschaftliche Forschung* 66 (4): 274–305.

Sinatra, Roberta, Dashun Wang, Pierre Deville, Chaoming Song, and Albert-László Barabási. 2016. Quantifying the evolution of individual scientific impact. *Science* 354 (6312).

Spurk, Daniel, Annika L. Meinecke, Simone Kauffeld, and Judith Volmer. 2015. Gender, Professional Networks, and Subjective Career Success Within Early Academic Science Careers. *Journal of Personnel Psychology* 14 (3): 121–130.

Sturm, Jan-Egbert, and Heinrich W. Ursprung. 2017. The Handelsblatt rankings 2.0: Research rankings for the economics profession in Austria, Germany, and Switzerland. *German Economic Review* 18 (4): 492–515.

Vidgen, Richard, Michael Mortenson, and Philip Powell. 2019. Invited viewpoint: How well does the Information Systems discipline fare in the Financial Times' top 50 Journal list? *The Journal of Strategic Information Systems* 28 (4).

Vogel, Rick, Fabian Hattke, and Jessica Petersen. 2017. Journal rankings in management and business studies: What rules do we play by? *Research Policy* 46 (10): 1707–1722.

Walter, Andreas. 2011. The effects of coauthorship on the quality of financial research papers. *Zeitschrift für Betriebswirtschaft* 81 (2): 205–234.

Werker, Claudia, and Christian Hopp. 2020. Balancing act between research and application: how research orientation and networks affect scholars' academic and commercial output. *Journal of Business Economics* 90 (8): 1171–1197.

Wuchty, Stefan, Benjamin F. Jones, and Brian Uzzi. 2007. The increasing dominance of teams in production of knowledge. *Science* 316 (5827): 1036–1039.

Ynalvez, Marcus A., and Wesley M. Shrum. 2011. Professional networks, scientific collaboration, and publication productivity in resource-constrained research institutions in a developing country. *Research Policy* 40 (2): 204–216.

8. Appendix

Appendix III-A: Correlation matrix

	Age at Tenure	Female	PhD Top Reputation University	International PhD	Same University Graduation and PhD	# of Different Coauthors	Average Coauthors per Publication	Publications with German Title	Publications in DACH Journals	Publications in GBE Journals	At Least One GBE Journal	# Jourqual A	At Least One Jourqual A	# Jourqual A+	At Least One Jourqual A+	# FT50	At Least One FT50
Age at Tenure		-0.06	-0.05	-0.04	0.05	-0.03	-0.06	**0.10**	0.06	**-0.07**	**-0.12**	**-0.09**	**-0.08**	-0.07	**-0.10**	-0.05	-0.06
Female	-0.06		0.00	0.01	0.01	-0.03	0.07	**-0.12**	**-0.10**	-0.02	-0.07	0.01	0.04	-0.04	-0.03	-0.01	0.00
PhD Top Reputation University	-0.05	0.00		-0.03	**0.12**	0.03	0.05	0.04	0.05	**0.11**	**0.09**	-0.03	0.04	**0.09**	**0.08**	0.04	0.05
International PhD	-0.04	0.01	-0.03		**-0.12**	0.06	0.03	**-0.21**	**-0.27**	**-0.15**	**-0.15**	0.05	0.05	**0.19**	**0.20**	**0.14**	**0.17**
Same University Graduation and PhD	0.05	0.01	**0.12**	**-0.12**		-0.07	**-0.08**	**0.10**	**0.10**	-0.02	-0.04	**-0.10**	-0.05	-0.05	**-0.08**	**-0.11**	**-0.10**
# of Different Coauthors	-0.03	-0.03	0.03	0.06	-0.07		**0.64**	**-0.30**	**-0.32**	**-0.21**	-0.01	**0.37**	**0.29**	**0.11**	**0.11**	**0.25**	**0.22**
Average Coauthors per Publication	-0.06	0.07	0.05	0.03	**-0.08**	**0.64**		**-0.44**	**-0.45**	**-0.18**	**-0.11**	**0.32**	**0.32**	**0.19**	**0.19**	**0.28**	**0.25**

Continued on next page

Appendix III-A continued from previous page

Publications with German Title	**0.10**	**-0.12**	0.04	**-0.21**	**0.10**	**-0.30**	**-0.44**		**0.90**	**0.35**	**0.31**	**-0.46**	**-0.50**	**-0.24**	**-0.23**	**-0.34**	**-0.38**
Publications in DACH Journals	0.06	**-0.10**	0.05	**-0.27**	**0.10**	**-0.32**	**-0.45**	**0.90**		**0.41**	**0.37**	**-0.46**	**-0.49**	**-0.30**	**-0.30**	**-0.41**	**-0.45**
Publications in GBE Journals	**-0.07**	-0.02	**0.11**	**-0.15**	-0.02	**-0.21**	**-0.18**	**0.35**	**0.41**		**0.63**	**-0.17**	**-0.16**	-0.06	-0.03	**-0.09**	-0.06
At Least One GBE Journal	**-0.12**	-0.07	**0.09**	**-0.15**	-0.04	-0.01	**-0.11**	**0.31**	**0.37**	**0.63**		**-0.07**	-0.04	-0.04	-0.04	-0.04	-0.02
# Jourqual A	**-0.09**	0.01	-0.03	0.05	**-0.10**	**0.37**	**0.32**	**-0.46**	**-0.46**	**-0.17**	**-0.07**		**0.71**	**0.15**	**0.16**	**0.43**	**0.38**
At Least One Jourqual A	**-0.08**	0.04	0.04	0.05	-0.05	**0.29**	**0.32**	**-0.50**	**-0.49**	**-0.16**	-0.04	**0.71**		**0.22**	**0.21**	**0.40**	**0.45**
# Jourqual A+	-0.07	-0.04	**0.09**	**0.19**	-0.05	**0.11**	**0.19**	**-0.24**	**-0.30**	-0.06	-0.04	**0.15**	**0.22**		**0.89**	**0.66**	**0.57**
At Least One Jourqual A+	**-0.10**	-0.03	**0.08**	**0.20**	**-0.08**	**0.11**	**0.19**	**-0.23**	**-0.30**	-0.03	-0.04	**0.16**	**0.21**	**0.89**		**0.65**	**0.64**
# FT50	-0.05	-0.01	0.04	**0.14**	**-0.11**	**0.25**	**0.28**	**-0.34**	**-0.41**	**-0.09**	-0.04	**0.43**	**0.40**	**0.66**	**0.65**		**0.78**
At Least One FT50	-0.06	0.00	0.05	**0.17**	**-0.10**	**0.22**	**0.25**	**-0.38**	**-0.45**	-0.06	-0.02	**0.38**	**0.45**	**0.57**	**0.64**	**0.78**	

Notes: This table displays a correlation matrix of the dependent variables used in the study. Bold values indicate correlations that are statistically significant on the 0.05 level.

Appendix III-B: Most common journal outlets

Panel A: Tenure in the 1990s

Rank	Journal	# of Publications
1	Schmalenbachs Zeitschrift für betriebswirtschaftliche Forschung	99
2	Journal of Business Economics	95
3	European Journal of Operational Research	21
4	Business & Information Systems Engineering	18
5	OR Spectrum	17

Panel B: Tenure in the 2000s

Rank	Journal	# of Publications
1	Journal of Business Economics	230
2	Schmalenbachs Zeitschrift für betriebswirtschaftliche Forschung	152
3	Business & Information Systems Engineering	66
4	Schmalenbach Business Review	39
5	European Journal of Operational Research	36

Panel C: Tenure in the 2010s

Rank	Journal	# of Publications
1	Journal of Business Economics	130
2	Business & Information Systems Engineering	54
3	Schmalenbachs Zeitschrift für betriebswirtschaftliche Forschung	51
4	European Journal of Operational Research	46
5	Schmalenbach Business Review	34

Notes: This table reports the most common journal outlets in which the professors in our sample publish until they obtain their first tenured professorship, dependent on the decade in which they obtained their first tenured professorship.

IV. Closing the Gender Gap in Academia? Evidence from an Affirmative Action Program

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Closing the Gender Gap in Academia?

Evidence from an Affirmative Action Program

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Abstract – This study investigates a unique incentive-based affirmative action program in Germany's academic labor market. By analyzing a sample of business administration professors, we document that the probability that a newly tenured professor is female increases at universities that participate in this government program compared to universities that do not. By delving deeper into the mechanisms of the program, we show that program universities lowered the entry barrier for tenured professorships regarding publication records for new female professors. While favoring women, we show that the program had no harmful effects on male professors regarding the entry barrier to tenured professorships. Overall, we provide evidence of the effectiveness of financial incentives as a means of reducing female underrepresentation in academic labor markets.

Keywords: Affirmative action, difference-in-differences, gender equality, higher education, research productivity

JEL-Codes: I23, J16, J71, M12

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1. Introduction

Affirmative action policies are frequently implemented to close the gender gap in labor markets. There is an extensive body of literature documenting such a gender gap in labor markets regarding career prospects and wages (e.g., Bertrand and Hallock (2001); Booth (2009); Weichselbaumer and Winter-Ebmer (2007)). Economic theory suggests that the gender gap in labor markets is caused by a lower level of investment in education by women (Bertrand et al. 2010; Lavy 2008) and by gender differences in competitive behavior (Balafoutas et al. 2012; Calsamiglia et al. 2013; Niederle and Vesterlund 2010). Both these aspects might be detrimental to female career prospects in competitive labor market environments. Alternatively, the gender gap in labor markets can be rationalized by discrimination against women (Goldin and Rouse 2000), which creates a so-called glass ceiling (Bertrand et al. 2019; Gayle et al. 2012). While policymakers implement affirmative action policies to improve the situation for women in labor markets, previous research shows that the success of such policies largely depends on acceptance within the affected group (Balafoutas et al. 2016). Our study examines a unique incentive-based affirmative action government policy in Germany's academic labor market. We show that this policy benefits women and does not harm men regarding the entry barrier for a tenured professorship; hence, it should lead to a high acceptance. Consequently, this policy could serve as a future role model for affirmative action policies.

While affirmative action policies in the academic sector typically do not apply incentives to support women, the program analyzed in this study is based on monetary incentives. Prior affirmative action policies in the academic labor market include, among others, (gender-neutral) tenure-clock stopping policies (Antecol et al. 2018; Manchester et al. 2010, 2013), dual-career policies (Juraqulova et al. 2019), and gender quotas (Park 2020).

In our study, we analyze the so-called *Professorinnenprogramm* (Women Professors Program [WPP]), which German policymakers implemented in 2007. This program does not force universities to participate but offers financial incentives to implement gender equality concepts to increase the share of female professors. The main goals of the program

are to improve gender equality in academia and to increase the share of women in all academic career steps, particularly among professors (Löther 2019b).[1] If included in the program, a university can receive financial support when appointing a female professor who has not been tenured elsewhere.[2]

In the first step of our empirical analyses, we test whether the WPP was successful in its goal of getting more women to become professors. In particular, we focus on one field: business administration. With over 200,000 enrolled students (Statistisches Bundesamt 2020), the subject of business administration accounts for the largest number of students in Germany. Hence, professors in this subject can function as role models for a pivotal number of individuals, which is a crucial argument for affirmative action policies in general and in the academic labor market in particular (e.g., Bayer and Rouse (2016); Beaman et al. (2012)). With our first research question, we analyze whether the probability that a newly tenured business administration professor is female increased more strongly at universities that participated in the WPP compared to universities that did not participate in the program.

In the second step, we address how the WPP mechanism supports women in their path to becoming tenured professors. We believe that this analysis is of particular value because, thus far, program evaluations often focus on the effect of the programs but neglect the mechanisms driving the effect (e.g., Müller and Albrecht (2016)). Since publications in peer-reviewed academic journals are the most important determinants of academic promotion (e.g., Bajo et al. (2020); Heckman and Moktan (2020)), one likely channel could be universities changing their requirements to lower the entry barrier for young female researchers.

Therefore, our second research question is whether the introduction of the program has affected the publication requirements of both male and female newly tenured professors.

[1] Please visit the following websites to receive further information about the program as well as external links to the original legal documents of the WPP (last accessed in March 2021):
https://www.gwk-bonn.de/themen/foerderung-von-hochschulen/professorinnenprogramm/
https://www.bmbf.de/de/das-professorinnenprogramm-236.html

[2] Please refer to Section 3 for a detailed discussion of the WPP.

This research question matches a broad range of literature that discusses the effect of affirmative action policies in politics on the quality of politicians (e.g., Aldrich and Daniel (2020); Allen et al. (2016); Baltrunaite et al. (2014); Braga and Scervini (2017); Murray (2010); Weeks and Baldez (2015)). In particular, these papers investigate the hypothesis "that gender quotas can lower barriers in the recruitment environment of elections for women" (Aldrich and Daniel 2020, p. 743). We believe that our setting enables us to analyze this hypothesis in academia, where, to the best of our knowledge, a comparable analysis has been missing thus far. In addition, our dataset allows us to precisely measure the actual publication records of professors at the time they obtain tenure, which equals the entry barrier in publications to obtain a tenured professorship in business administration.

Our study makes an essential contribution to the literature. As we focus exclusively on one discipline, business administration, we can analyze the program's effect on the entry barrier to obtaining a tenured professorship for female professors. Consequently, we examine whether publication records – at the time of obtaining tenure – of female professors who obtained tenure at program universities have changed compared to the publication records of female professors who obtained tenure at non-program universities.

Prior evidence also suggests that affirmative action policies might affect women and their male peers. For example, Baltrunaite et al. (2014) and Besley et al. (2017) show gender quotas in politics can crowd out men with lower qualifications. Hence, we also analyze the impact of the WPP on the publication records of newly tenured male professors. Balafoutas et al. (2016) stressed that it is crucial for the success of affirmative action policies that all affected groups accept them. In our setting, this would particularly be the case if the WPP provided benefits for female professors-to-be while not harming male professors-to-be regarding their publication records.

To address our research questions, we draw on a hand-collected dataset of 827 business administration professors who obtained tenure in Germany between 1996 and 2017. Using the WPP as a quasi-natural experiment, we apply a difference-in-differences (diff-in-diff) approach to answer our research questions. The identification strategy of the diff-in-diff

approach relies on the assumption that, in the absence of the WPP, the treatment group (i.e., WPP universities) and control group (i.e., remaining universities) would have followed parallel trends. We follow De Paola et al. (2014) and provide two tests (showing parallel trends graphically and creating a placebo program) regarding the parallel trends assumption. Our results confirm that the assumption of parallel trends is appropriate in our setting.[3]

We find that at universities that did participate in the WPP, the probability that a newly appointed professor is female increased by approximately ten percentage points compared to universities that did not participate in the program. Given that the average percentage of newly tenured female professors in our sample was around 20 percent, the effect of the program was substantial. In addition, our analysis shows that universities reduced publication requirements for newly tenured female professors after being accepted into the WPP without affecting the publication requirements for newly tenured men. More precisely, our data shows that the average publication record of newly tenured professors increased over the years for both males and females.[4] This development is in line with observations made by Ayaita et al. (2019) and Röbken (2009) about German academic business administration being subjected to more international competition, emphasizing journal articles.[5] However, we find that publication records of women who obtained tenure at program universities increased significantly less than those of women who obtained tenure at non-program universities. In particular, the effect of the reduction in the entry barrier concerning publication requirements for new female professors is substantial and revolves around 50 percent. By contrast, for male professors, we do not find significant differences concerning changes in publication records according to the participation of the appointing university in the WPP. The fact that the implementation of the WPP did not raise the bar for male professors is an important finding, as Balafoutas et al. (2016) show

[3] Please refer to Section 6.2 for a detailed discussion of our identification strategy.
[4] For a graphical description, please see Figure IV-2.
[5] Similar observations are made in economics by Combes et al. (2008) and Rauber and Ursprung (2008).

that the success of affirmative action programs crucially depends on the acceptance of all the affected groups.

Our work contributes to the existing literature on gender discrimination in academia, particularly to the strand focusing on policy interventions to improve gender equality. Additionally, we provide evidence for the success of the WPP in the discipline of business administration. From a broader perspective, our results provide evidence that financial incentives, such as the WPP, can be useful in the context of affirmative action policies in academic labor markets. This might especially be important, as many political attempts thus far have applied quotas that universities or companies have to reach. Past research has found mixed evidence regarding the effectiveness of such quotas (e.g., Bennouri et al.(2020); Maggian et al. (2020)). Other non-financial incentive-based approaches also appear to have little impact (Mateos de Cabo et al. 2019), which is why future policymakers might consider investigating financial incentives as a means of fostering equal female labor force participation in academic labor markets.

In the remainder of this paper, we first discuss the related literature on the gender gap in labor markets and affirmative action policies in Section 2. In Section 3, we provide detailed information on the WPP. The data and methodology are described in Section 4. Section 5 presents the main findings, while Section 6 digs deeper and addresses several additional facets regarding the WPP and a set of robustness checks. The study ends with a discussion and a conclusion.

2. The Gender Gap in Labor Markets and Affirmative Action

2.1 The Gender Gap in Labor Markets

A growing body of literature documents and analyzes the gender gap in labor markets concerning representation in leading positions and wages (e.g., Bertrand and Hallock (2001); Blau and Kahn (2013); Booth (2009); McGee et al. (2015); Weichselbaumer and Winter-Ebmer (2007)). The gender gap in labor markets is documented in many countries in

general including Germany (Bergmann et al. 2019; Fitzenberger et al. 2004; Hirsch 2013; Hunt 2002; Machin and Puhani 2003).

According to economic theory, this gender gap and the under-representation of women in leading positions in the labor market can be explained from at least two perspectives. First, previous literature documents gender differences in competitiveness (Calsamiglia et al. 2013; Gneezy et al. 2003; Niederle et al. 2013; Niederle and Vesterlund 2007, 2010) and investment in education (Bertrand et al. 2010; Lavy 2008). These strands of the literature stress that part of the vertical labor market segregation arises from the self-selection of women into occupations. Second, literature attributes the gender gap in labor markets to discrimination (Goldin and Rouse 2000; Neumark 2018; Riach and Rich 2002). This discrimination results in the so-called glass ceiling, which prevents women from entering the highest ranks of labor markets (Bertrand et al. 2019; Gayle et al. 2012). This glass ceiling concept describes an invisible yet impenetrable barrier that prevents minorities, particularly women, from climbing the career ladder into the highest ranks of labor, irrespective of their skills or accomplishments (U.S. Glass Ceiling Commission 1995).

2.2 Affirmative Action Policies

In recent years, a broad range of research has focused on affirmative action policies seeking to 'break' the glass ceiling. Affirmative action policies attempt to increase diversity in various settings, such as labor markets or access to education, by giving preferential treatment to a disadvantaged group, which can be identified by, e.g., gender, race, or religion (Bagde et al. 2016). The rationale behind affirmative action is that members of some groups do not reach positions in the labor market that correspond to their skill level, either because of historical discrimination or a glass ceiling. By introducing affirmative actions, a more efficient allocation of talent can be achieved, which ultimately benefits the overall economy in the long run (Fang and Moro 2011).

In the private sector, affirmative action policies that support female labor force participation typically consist of gender quotas for corporate boards. Recent examples

include gender quotas in various countries, such as Germany (Kirsch 2017), Norway (Bertrand et al. 2019; Geys and Sørensen 2019; Matsa and Miller 2013), Spain (Mateos de Cabo et al. 2019), Italy, France, and the United Kingdom (Bennouri et al. 2020). In the public sector, particularly in politics, affirmative action policies often use gender quotas. Prominent examples include quotas in Germany (Davidson-Schmich 2006), France (Lassébie 2020), Italy (Baltrunaite et al. 2014; Braga and Scervini 2017; De Paola et al. 2014), and Spain (Bagues and Campa 2021).

However, research has focused not only on the glass ceiling and affirmative action policies in corporate or political settings but also on higher education, respectively academia. There is a pivotal amount of evidence for the existence of a gender gap in the academic labor market in various countries such as Argentina (Bukstein and Gandelman 2019), France (Sabatier 2010), Italy (Corsi et al. 2018; De Paola et al. 2018), and the United States (Lundberg and Stearns 2019; Perna 2005; Treviño et al. 2018).

Furthermore, evidence indicates that the gender gap in academia goes beyond female labor force participation. More precisely, the literature shows that female researchers receive less recognition for their achievements (Zacchia 2020), papers with female authors are less likely to receive 'revise and resubmit' verdicts by journals (Card et al. 2020), and female presenters are treated more critically at research seminars and job market interviews (Dupas et al. 2021).

International policymakers have applied affirmative action policies in the past to improve the situation of women in the academic labor market. For example, countries such as Spain and Italy have introduced gender quotas in their scientific evaluation committees (Bagues et al. 2017). In the United States, policies like (gender-neutral) tenure-clock-stopping policies (Antecol et al. 2018; Manchester et al. 2010, 2013) and dual-career policies (Juraqulova et al. 2019) have been introduced. However, results regarding the effectiveness of these affirmative action policies are mixed. Antecol et al. (2018), for example, suggest that gender-neutral tenure clock-stopping policies reduce the tenure rates of women, and Bagues et al. (2017) find that an increased presence of women in scientific evaluation committees does not benefit female candidates either.

3. The Women Professors Program

In contrast to the Anglo-American system, in Germany, there was no tenure-track system for many decades, and only a few tenured positions exist below full professorship (Lutter and Schröder 2016). Traditionally, academic career paths in Germany consist of three stages. First, a junior researcher is a doctoral student earning a Ph.D. Second, after completing the Ph.D., a junior researcher becomes a post-doctoral fellow (*Habilitand/in*) employed at a professor's chair, usually without tenure, for several (four to eight) years. Last, a researcher becomes a full professor[6], usually at a different university, accompanied by obtaining tenure. Hence, becoming a professor for the first time implies tenure. To help the reader understand how the WPP works and which career stage it addresses, we describe this unique affirmative action program in detail in the following sections.

In 2007, the German Federal Ministry of Education and Research (federal government) and the education ministries of the federal states agreed to launch the WPP. The first funding period consisted of five years, beginning in 2008 and ending in 2012. The respective political institutions defined three goals for the program (Löther 2019b; Löther and Glanz 2017; Zimmermann 2012).

While the WPP states three goals, two – to support gender equality and increase women's representation in all academic career steps – can be considered long-term and difficult to quantify. In contrast, the third goal of the WPP is to increase the share of female researchers in top academic positions (i.e., professors) at universities. As the WPP provides direct funding for achieving this goal, we consider this the most important and tangible goal of the WPP, at least in the short term, and thus focus on this specific goal in our study.

After the first round of the program was evaluated as successful in terms of its acceptance in the academic community by Zimmermann (2012), a second round was

[6] By the term 'full professor', we refer to C3/C4, respectively, W2/W3 professorships according to the German institutional framework. These professorships are comparable to permanent academic positions as a full or an associate professor in the international context.

launched, which lasted from 2013 to 2017. In each of these rounds, the federal government and the federal states of Germany provided €150 million to fund the program, resulting in a total of €300 million spent over ten years, which can be considered 'additional' money and not a reshuffling of resources.[7]

The WPP attempts to reach its short-term goal of increasing the share of female professors by creating competition for the funding of professorships assigned to female researchers who have not yet held a tenured professorship. Notably, universities that want to participate in the program must submit gender equality concepts, which an independent panel evaluates. These equality concepts are supposed to point out how the universities aim to contribute to the goals of the WPP. The submitted concepts covered three aspects. First, universities must outline how they will contribute to the short-term goal of the WPP and increase the share of female professors.[8] Second, universities must point out how they will contribute to female junior researchers' career and personnel development. Third, universities should enhance their efforts to increase the share of women in subjects in which female underrepresentation is particularly strong. If the gender equality concept of a university is positively evaluated, the university is allowed to participate in the WPP.[9]

Participation in the program allows universities to receive substantial funding when they appoint a female professor. Specifically, universities can obtain funding for up to three professorships assigned to women, which universities can apply for after appointing a woman. The funding covered up to €150,000 per year and professorship over the five years of each program round. Consequently, a university can obtain funding of up to €2.25 million during one round of the program. The money is distributed using a first-come, first-served principle, offering universities an incentive to appoint female professors quickly.

For the first round of the WPP, 152 universities applied by submitting a gender equality concept. In total, 124 universities were accepted (82%) (Zimmermann 2012). For the second

[7] Currently (2018-2022) a third round of the program is running. However, we started collecting our data at the end of 2018 and therefore do not include this third round of the WPP in this paper.
[8] Please note that the WPP does not differentiate between disciplines with a generally higher or lower share of female representation but rather attempts to reach the stated goals over all academic disciplines.
[9] Please note that actual gender equality concepts are not publicly available.

round of the program, 184 universities applied for the program, of which 147 were accepted (80%) (Löther and Glanz 2017). These values underline the approval of the program within the higher education system in Germany. According to Löther and Glanz (2017) out of the 147 universities that participated in the second round of the WPP, approximately 55% were registered in the *Hochschulrektorenkonferenz (HRK)*, a union of higher education institutions in Germany that accounts for over 90 percent of enrolled students. Furthermore, these evaluations found that the program reached one crucial goal: the increase in the share of female professors. According to these and expressed in numerical terms, 274 women were appointed during the first round of the program, and an additional 250 women were appointed until the evaluation of the second round (end of June 2017) (Löther and Glanz 2017; Zimmermann 2012).

To put the extent of the WPP into perspective, we estimate that it funded approximately 14% of all tenured professorships[10] awarded to women in PhD-granting universities[11] between 2008 and 2012[12]. Similarly, for the second round of the program, approximately 15% of the professorships awarded to women received funding from the WPP. These numbers should be considered with caution because they rely strongly on the assumptions taken. Nonetheless, the reported numbers should help to assess the extent of WPP properly.

[10] We count the number of W2/W3 professorships actually awarded (Ernennung), not only offered (Berufung), in Germany in the respective periods as reported in GWK Gemeinsame Wissenschaftskonferenz (2019) and older versions of the same report.

[11] According to Löther and Glanz (2017), approximately 60% of funding was paid out to PhD-granting universities in both, the first and second round of the program. This would lead to 164 funded professorships between 2008 and 2012, and 150 professorships between 2013 and 2017, assuming that funding and number of professorships go hand in hand.

[12] Looking at numbers from older versions of the report from GWK Gemeinsame Wissenschaftskonferenz (2019), we count a total of 4,624 professorships (W2/W3) awarded in the period 2008-2012 in PhD-granting universities, 1,135 of which were awarded to women. Similarly, we count 3,247 professorships awarded between 2013 and 2017, 1,015 to women.

4. Data and Methodology

4.1 Sample and Summary Statistics

We compiled a unique dataset to analyze the impact of the WPP on business administration professors in Germany. In the first step, we hand-collected all professors employed at a doctorate-granting university in the DACH[13] region at the end of 2018 and obtained tenure in Germany, which yielded 974 individuals. Of these 974 professors, 827 received their first tenured professorship between 1996 and 2017 and thus constitute our final sample. In the second step, we collected data from these professors' curriculum vitae (CV), which are available on the Internet. In particular, we collected information regarding the year and institution of each career step (doctorate and first-tenured professorship) as well as the gender of each professor.[14]

Our first research question addresses the share of newly tenured female professors. The dependent variable in our respective analyses is a dummy variable that equals one if the newly tenured professor is a woman. Panel A of Table IV-1 shows that 19% of the professors in our sample are women, a value far below parity. However, Hilber et al. (2021) reported a comparable value of 20% females among economics professors in the DACH region.

To measure the publication records of professors at the time they obtained their first tenured professorship, we use publications in peer-reviewed journals, as they are one of the most important appointment requirements to obtain a tenured professorship (Bajo et al. 2020; Schulze et al. 2008). To measure the research output of the professors in our sample, we merged the CV data with publication data from the online research monitoring portal *Forschungsmonitoring*. Initially commenced by the *German Economic Association*, *Forschungsmonitoring* today is quality-approved by both the *KOF*

[13] The DACH region comprises of the three countries Germany (D), Austria (A), and Switzerland (CH).

[14] We omit professors who obtain tenure in years prior to 1996, because we believe that appointments dated far back do not provide useful information when comparing them to appointments in the treatment period. Additionally, in 1992 the first female professor obtained tenure in our initial sample. Hence, we do not lose many female observations when omitting appointments in years prior to 1996.

Konjunkturforschungsstelle at ETH Zurich and the *Düsseldorf Institute for Competition Economics (DICE)* at Heinrich-Heine University Düsseldorf. Recent research, such as Ayaita et al. (2019), Backes-Gellner et al. (2018), or Bäker (2015), also draws on publication data provided by *Forschungsmonitoring*.[15]

The publication data contain information regarding the academic title, year, journal, and coauthors of every publication of all professors in our sample. Additionally, *Forschungsmonitoring* assigns each publication a score according to the *VHB Jourqual 3* (journal) rating. The *VHB Jourqual 3* rating is the most widely used tool to rate business research journals in German-speaking countries (e.g., Eisend (2011); Schrader and Henning-Thurau (2009))[16] and has been used for research evaluation as well (e.g., Clermont (2016)). This rating ascribes any journal to one of six grades (A+, A, B, C, D, not ranked), which are transformed into respective points (1, 0.5, 0.25, 0.1, 0.05, 0.025) by *Forschungsmonitoring*. We adjust this value by the number of coauthors and the scope of the publication[17] and calculate the sum of all publications for each professor until she obtained her first tenured professorship. To be precise, we include a one-year lead and calculate our dependent variable, *JQL3 Score*, based on all publications until one year after the professor obtained their first tenured professorship[18] as typically, during the appointment process for professorship, ongoing projects, and forthcoming papers are considered as well. Furthermore, it is rare to have new projects that start after obtaining tenure and are published within one year. The *JQL3 Score* is calculated as follows:

$$JQL3\ Score_i = \sum_{k=1}^{k=K} \frac{CF_k\ x\ JQL3\ Points_k}{N_k} \qquad \text{(IV.1)}$$

[15] Please read the papers by Hilber et al. (2021) and Sturm and Ursprung (2017) for more information.

[16] Even though the cited papers refer to the predecessor of the *VHB Jourqual 3*, the *VHB Jourqual 2*, the key message – this rating is the most prominent tool to rank business research journals in German-speaking countries – is still true.

[17] This adjustment gives journal publications a higher weight (CF = 1) compared to short articles (CF = 0.5), comments (CF = 0) or book reviews (CF = 0), for example.

[18] We replicate our analyses with a modification of the *JQL3 Score*, based on the exact year of tenure. The results do not change and we present them in Section 6.1.

As shown in the formula above, the *JQL3 Score* for each professor i is calculated from $k = 1$, that is, the first publication at the beginning of her (publishing) career until $k = K$, that is, the last publication in the first year after the professor obtained tenure. CF_k is the so-called correction factor that adjusts for the scope of publication k. *JQL3 Points*$_k$ are the points assigned by *Forschungsmonitoring* according to the *VHB Jourqual 3* of the journal in which publication k is published. Finally, we divide the product of the correction factor and *JQL3 points* by N_k, that is, the number of authors listed on publication k.

Table IV-1: Descriptive statistics – distribution of key variables

Panel A	Mean	5% Quantile	25% Quantile	50% Quantile	75% Quantile	95% Quantile
Age in 2018	48.13	38.00	42.00	48.00	53.00	59.00
Time to Tenure	6.70	3.00	5.00	6.00	8.00	12.00
Age Doctorate	30.65	27.00	29.00	31.00	32.00	35.00
Age First Professorship	37.35	32.00	35.00	37.00	39.00	43.00
Female Professor	0.19	0.00	0.00	0.00	0.00	1.00
Panel B	**Mean**	**5% Quantile**	**25% Quantile**	**50% Quantile**	**75% Quantile**	**95% Quantile**
JQL3 Score (one-year lead)	1.07	0.00	0.40	0.89	1.47	2.98
JQL3 Score (no lead)	0.91	0.00	0.32	0.75	1.25	2.37
Number of Publications (one-year lead)	15.72	1.00	7.00	13.00	20.00	40.00
Number of Different Coauthors (one-year lead)	9.24	0.00	3.00	7.00	12.00	27.00

Notes: This table shows variables regarding the professors in our sample. Panel A displays personal variables, which we gathered from the CVs of the professors. Panel B displays variables regarding the publication variables, which we derive from *Forschungsmonitoring*.

Panel B of Table IV-1 shows the distribution of our main dependent variable and further variables regarding professors' publications. On average, a professor has 15.72 publications and 9.24 different coauthors until one year after they obtained tenure. The mean *JQL3 Score* (one-year lead) of professors in our sample was 1.07, whereas the median was slightly below 0.89.

Panel A of Table IV-1 displays the distribution of key (CV) variables used in our analysis. On average, a professor was 48 years old at the end of 2018 when we compiled

the dataset. The mean time to tenure, that is, the difference (in years) between finishing Ph.D. and the first tenured professorship, is slightly less than seven years. Panel A shows that a professor has an average age of 31 years when earning their Ph.D.[19] An average professor is 37 years old when obtaining their first-tenured professorship.

When we split our sample by gender, we find significant differences between male and female professors. Table IV-2 shows that female professors in our sample are younger when earning their PhDs and obtaining tenure compared to their male peers. In addition, Table IV-2 displays the significant differences in publication records between men and women until they obtain their first-tenured professorship. The females in our sample had, on average, a significantly lower number of publications (11.69 compared to 16.66) and significantly fewer coauthors (6.63 compared to 8.11). Finally, the mean *JQL3 Score* (one-year lead) is significantly lower for women (0.83) than for men (1.13). This is in line with previous literature documenting a gender publication gap (e.g., Jokinen and Pehkonen (2017); Madison and Fahlman (2020)).

Table IV-2: Descriptive statistics – comparison of female and male professors

	Males	Females	Difference
Mean Age in 2018	48.67	45.83	2.84***
Mean Age Doctorate	30.78	30.10	0.68***
Mean Age Tenure	37.47	36.83	0.64**
Mean Time to Tenure	6.69	6.72	-0.03
Mean Number of Publications (one-year lead)	16.66	11.69	4.97***
Mean Number of Different Coauthors (one-year lead)	8.11	6.63	1.48**
Mean *JQL3 Score* (no lead)	0.96	0.70	0.26***
Mean *JQL3 Score* (one-year lead)	1.13	0.83	0.30***

Notes: This table shows the mean of each variable by gender. We test differences with t-tests.
*p<0.1; **p<0.05; ***p<0.01.

[19] To extend our dataset, we use imputed values for both variables (Time to Tenure and Age Doctorate) as well as for two further variables, which we only use in the descriptive statistics: the age at which a professor obtains tenure and the age in 2018. More precisely, we apply predictive mean matching (PMM) (e.g., Little (1988); Rubin (1986); Vink et al. (2014)) because this approach does not change the distribution of the variables.

4.2 Methodology

Our first objective is to estimate the effect of the WPP on the probability that a newly tenured business administration professor is a woman. In addition, we explore whether the WPP lowers the entry barrier for female professors at program universities in terms of publication records. With a treatment like the WPP, it is appropriate to apply a diff-in-diff estimation. However, the structure of the WPP only partially allows a standard setup. In particular, the fact that universities might enter the program only in the second round or drop out after the first round forces us to modify the standard diff-in-diff method somewhat. To better understand these modifications, we first concentrate on the first round only and restrict our sample to professors who obtained tenure until 2012. This enables us to stay as close to a standard diff-in-diff setup as possible. Subsequently, we include information beyond 2012 and thereby the program's second round.

We develop our econometric model using a three-step process, moving from a more to a less restrictive framework. First, we deploy a standard diff-in-diff setup that, when using the restricted sample (1996-2012), looks as follows:

$$\begin{aligned} Female_{iut} = {} & \beta_0 + \beta_1 \, Post\ (Round\ 1)_t \times Treated\ (Round\ 1)_u \\ & + \beta_2 \, Treated\ (Round\ 1)_u + \beta_3 \, Post\ (Round\ 1)_t + \gamma X_{iut} + \varepsilon_{iut} \end{aligned} \tag{IV.2}$$

In this model, *Female* is a binary variable that equals one if professor i tenured university u in year t is a woman. *Post (Round 1)* is also a binary variable that takes the value of one if the professor in question received tenure in 2008-2012, the years in which the first round of the WPP was in effect. The dummy *Treated (Round 1)* equals one if the respective professor obtained tenure at university u that participated in the first round of the WPP. Therefore, the interaction of the *Post* and *Treated* variables equals one if the observed professor obtained tenure at a program university during the program period. The coefficient of this interaction term shows the increased likelihood of a newly appointed professor being female when hired by a program university during the program period.

To increase the precision of our estimated coefficients and reduce potential endogeneity problems, we control for the level of gender equality[20] and the quality of the appointing faculty[21] and for the federal state[22] in which the university is located. Furthermore, we control for the field in which a professor operates, as in some fields (e.g., management), the share of female researchers is higher than in others (e.g., business information systems). Next to the university- and discipline-related control variables, we also control for the age at which a professor earns their doctorate and the time it subsequently took to get tenured. Furthermore, we proxy for the professional network of a professor by including the number of different coauthors they had until tenure. We include these personal control variables as we found significant differences between female and male professors in our sample concerning their characteristics.[23] By including these control variables, we first reduce the error term, thereby increasing the precision of our estimated coefficients, and then eliminate potential endogeneity problems that could arise because the control and treated groups may not be completely identical.

In the second step, we add a *Linear Time Trend* as an additional control. This linear time trend accounts for the fact that the share of female professors has likely increased over time for reasons other than the WPP. In this way, we achieve more precise estimates of the effect that the first round of the WPP had on the likelihood that a newly appointed professor is female and ensure that we do not assign such an overall time trend to the WPP.

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[20] To proxy for the level of gender equality at a university, we make use of the bi-annual reports *Hochschulranking nach Gleichstellungsaspekten* (University Ranking According to Equality Aspects) issued by the *GESIS – Leibniz-Institut für Sozialwissenschaften Kompetenzzentrum Frauen in Wissenschaft und Forschung (CEWS)*, which recently has been authored by Löther (2019a) This ranking assigns any university in our sample a rank from 1 (highest level of gender equality) to 12 (lowest level of gender equality). We include a set of dummy variables based on the ranking from 2003 as control variables in our regression models.

[21] We control for the quality of the faculty based on the *Handelsblatt* ranking. In particular, we do so by computing the average rank of universities in DACH countries obtained in the BWL rankings of 2010, 2012, 2014, and 2018. The average ranks are then divided into four groups: group A consisting of the top 10% of universities; group B, universities in the top 25% but not the top 10%; group C, universities in the top 50% but not top 25% and last group D, the bottom 50% of institutions. Despite the fact, that a specific rank might change from year to year, we believe that whether an institution ranks among the top 10% should be comparatively stable (e.g., Bäker et al. (2016)).

[22] We control for the federal state in which the university is located because it might be possible that several federal states have separate gender equality programs to promote women in academia.

[23] Please refer to Appendix IV-A for a detailed description of all variables.

Finally, we introduce our final model, replacing the linear time trend with *Year Dummies*. This model captures any year-specific variation that is otherwise not controlled for and makes the *Post* dummy redundant; that is, the year-fixed effects fully capture it. However, the interaction coefficient can still be interpreted in the same manner. Again, this indicates the extent to which a newly appointed professor was more likely to be female when hired by a program university during the program period. Given that the WPP aims to increase the probability of appointing female professors, we expect a positive sign for this coefficient.

Following the same three steps, the subsequent models include both WPP rounds, that is, expanding the sample period to 2017. Next to the treated, post, and interaction dummies for the first round, we now include similar dummy variables for the second round. Therefore, the *Post (Round 1)* dummy equals only one for the duration of the first round of the WPP, that is, for the years 2008 up to and including 2012. Similarly, the *Post (Round 2)* dummy equals one during 2013-2017. The interaction term *Post (Round 1) x Treated (Round 1)* captures the effect of participating in the first round of the WPP on the likelihood that a newly appointed professor is female compared to universities that did not participate in the first round of the WPP. The interaction term *Post (Round 2) x Treated (Round 2)* captures the effect of the second round of the WPP on the likelihood that a newly appointed professor is female compared to universities that did not participate in the second round.

In these three steps, we allow the two rounds to have different impacts on the probability that a woman is appointed. In addition, because we have no theoretical reasons to expect these two rounds to differ in their impact, we add a fourth step and thereby the final model, in which we restrict their impact to be the same. For this, we need to create a new *Treated (Combined Rounds)* variable that equals one if a university has participated in either the first, second, or both rounds of the WPP. The new *Post (Combined Rounds)* is the sum of the two existing post dummies. This new post variable is fully absorbed by the year dummies included.

We apply linear probability models (LPM) to address our first research question, as the LPM should be favored over a logit model for its ease of interpretation (e.g., Hellevik

(2009); Wooldridge (2010)). However, using a binary dependent variable typically requires models to account for this binary character specifically. Hence, we re-estimate our regression models using logit models and report the results in the robustness section.

As we have already elaborated and presented our econometric approach for the first research question, we now immediately move to the full sample and analyze both program rounds simultaneously. We apply the same steps to address the second research question. Therefore, we substitute our dependent variable with the *JQL3 Score* introduced in the previous section. It measures the publication record of a professor one year after obtaining tenure. As this variable is non-binary, we now estimate the standard OLS models.

We will first analyze women and men separately to allow for fundamental differences in publication records across genders. However, in our final model, we include both women and men so that we can compare the two in general, as well as women (men) who obtained professorships at program universities with women (men) who obtained professorships at non-program universities (counterfactual group). To, in this model, capture the effects for women and men separately, we interact the dummy variable *Female* with all three, the *Treated (Combined Rounds)* dummy, the *Year Dummies*,[24] and the interaction term *Post x Treated (Combined Rounds)*. We are most interested in the coefficient in front of this last triple interaction term. This can be interpreted in the same way as before and thus indicates whether the publication records of newly appointed female professors at program universities differ from those of female professors who obtained their first tenure at non-program universities.

Given our expectation that affirmative action policies might reduce the entry barrier for new female professors, we anticipate a negative sign for the coefficient of *Female x Post x Treated (Combined Rounds)* in this final specification and *Post x Treated (Combined Rounds)* in the other specification focusing only on women. We do not expect any notable impact of the *Post x Treated (Combined Rounds)* variable in neither the specification for

[24] Our results are also robust, if we do not interact the *Female* dummy with the *Year Dummies* and thus not allow for separate slopes for the publication records of female and male professors.

men nor the final model. However, if the WPP has made it more difficult for men to obtain such a tenured position, this coefficient would be positive and significant.

5. Results

5.1 The Probability that a Newly Appointed Professor is Female

Table IV-3 presents the coefficient estimates for the previously described LPMs. In columns (1), (2), and (3), we employ a sample of professors who obtained tenure until 2012 (n = 643) and thus focus on the first round of the WPP. Column (1) displays the results derive by running the standard diff-in-diff model. We find that universities that participated in the first round of the WPP are about 12.9 percentage points more likely to appoint a female professor than universities that did not participate in the first round of the WPP. This increase is statistically significant at the 5% level. There do not appear to be any general differences between the treated and non-treated universities and between the pre- and post-period; the *Treated (Round 1)* and the *Post (Round 1)* variables report (in an absolute sense) very small coefficient estimates that are anything but significantly different from zero. This means that program universities did not tend to hire more female professors before the program than non-program universities. This also indicates that the control variables effectively take care of potential differences between these groups and periods.

In Column (2), we add the linear time trend and derive similar results. The coefficient of the linear time-trend variable has the expected positive sign and is statistically significant. More precisely, the coefficient of our key interaction variable indicates that universities that participated in the first round of the WPP are approximately 12.0 percentage points more likely to appoint a female professor compared to those universities that did not participate in the first round of the WPP. We found that this increase is statistically significant at the 10% level. Therefore, there appears to be a pronounced upward *linear* trend in the proportion of newly appointed women in our sample.

Table IV-3: LPM regressions on the probability that a newly appointed professor is female

	Dependent variable: Female						
	Round 1 (1)	Round 1 (2)	Round 1 (3)	Round 1 & 2 (4)	Round 1 & 2 (5)	Round 1 & 2 (6)	Round 1 &2 (7)
Mean LHS	0.1602	0.1602	0.1602	0.1886	0.1886	0.1886	0.1886
Post (Round 1) x Treated (Round 1)	*0.1294***	*0.1206**	*0.1135**	*0.1579****	*0.1520***	*0.1447***	
	(0.0619)	*(0.0625)*	*(0.0629)*	*(0.0608)*	*(0.0611)*	*(0.0615)*	
Post (Round 2) x Treated (Round 2)				*0.0527*	*0.0450*	*0.0493*	
				(0.0825)	*(0.0827)*	*(0.0837)*	
Post x Treated (Combined Rounds)							*0.0975**
							(0.0502)
Treated (Round 1)	0.0004	0.0089	0.0084	-0.0457	-0.0398	-0.0403	
	(0.0504)	(0.0514)	(0.0521)	(0.0496)	(0.0501)	(0.0507)	
Treated (Round 2)				-0.0559	-0.0574	-0.0559	
				(0.0601)	(0.0598)	(0.0608)	
Treated (Combined Rounds)							-0.0719
							(0.0604)
Post (Round 1)	-0.0003	-0.0600		-0.0130	-0.0730		
	(0.0452)	(0.0582)		(0.0447)	(0.0575)		
Post (Round 2)				0.1490**	0.0506		
				(0.0714)	(0.0944)		
Linear Time Trend		0.0092*			0.0088*		
		(0.0055)			(0.0053)		
F Statistic: *Treated (Round 1) = Treated (Round 2) & Post (Round 1) x Treated (Round 1) = Post (Round 2) x Treated (Round 2)*				0.6893	0.7382	0.5858	
Year Dummies	No	No	Yes***	No	No	Yes***	Yes***
Federal State Dummies	Yes**	Yes***	Yes**	Yes**	Yes**	Yes	Yes
Equality Ranking Dummies	Yes	Yes	Yes	Yes**	Yes**	Yes**	Yes*
University Reputation Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Field Dummies	Yes	Yes	Yes	Yes***	Yes***	Yes***	Yes***
Personal Controls	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***
Observations	643	643	643	827	827	827	827
R^2	0.1063	0.1105	0.1249	0.1162	0.1191	0.1352	0.1323
F Statistic: Entire Model	1.8381***	1.8696***	1.5540***	2.4545***	2.4626***	1.9598***	1.9822***

Continued on next page

Table IV-3 continued from previous page

Notes: This table shows results from seven Notes: This table shows results from seven linear probability models. The dependent variable in all of these models is a dummy variable that equals 1, if a newly appointed professor is a woman (*Female*). In the first, second, and third model, we only focus on the first round of the WPP. Hence, we only have 643 observations in these models. The first model displays the standard difference-in-differences approach. *Post (Round 1)* equals 1 if a professor obtains tenure when the first round of the program is active (2008 2012). *Treated (Round 1)* equals 1 if a professor obtains tenure at a university that participates in the first round of the WPP. *Post (Round 1) x Treated (Round 1)* is the interaction term of the *Post (Round 1)* dummy and the *Treated (Round 1)* dummy. In the second model, we add the *Linear Time Trend* to our initial model. In the third model, we include *Year Dummies* for the year in which a respective professor obtains tenure. This absorbs the *Post (Round 1)* dummy. *Post (Round 1) x Treated (Round 1)* is the interaction term that equals 1 if a professor obtains tenure at a program university while the program is active. In the fourth, fifth, sixth, and seventh model, we focus on both rounds of the WPP. Hence, we have 827 observations in these models. The fourth model displays the equivalent to the standard difference-in-differences approach. *Post (Round 1)* equals 1 if a professor obtains tenure when the first round of the program is active (2008 2012). *Treated (Round 1)* equals 1 if a professor obtains tenure at a university that participates in the first round of the WPP. *Post (Round 2)* equals 1 if a professor obtains tenure when the second round of the program is active (2013 2017). *Treated (Round 2)* equals 1 if a professor obtains tenure at a university that participates in the second round of the WPP. The interaction term *Post (Round 1) x Treated (Round 1)* then captures the effect of participating in the first round of the WPP on the likelihood that a newly appointed professor is female in comparison to universities that did not participate. The interaction term *Post (Round 2) x Treated (Round 2)* captures the effect of the second round of the WPP on the likelihood that a newly appointed professor is female in comparison to universities that did not participate. In the fifth model, we add the *Linear Time Trend* to our initial model. In the sixth model, we include *Year Dummies* for the year in which a respective professor obtains tenure. This again absorbs the *Post* dummies. In our seventh and final model, we restrict the impact of both rounds of the WPP to be the same. Therefore, we introduce the dummy variable *Treated (Combined Rounds)* that equals 1 if a professor obtains tenure at a university that participates in either round of the WPP and a dummy variable called *Post (Combined Rounds)* that is simply the sum of the two existing post dummies. Since we include *Year Dummies* in this model, they absorb this *Post* dummy. For the fourth, fifth, and sixth model, we apply Wald F-Tests that test whether the coefficients of the treated dummies and the interaction terms of both rounds differ statistically significant from each other. We control for the field of business administration as well as for the federal state, the level of gender equality, the quality of the appointing university, the age at which these professors did obtain their doctorate, the time it took them to tenure, and the number of different coauthors in all models. Again, we apply Wald F-Tests to determine whether each group of control variables differs statistically significant from zero. The stars besides the respective controls indicate the results of the Wald F-Tests. We report robust standard errors in parentheses. Significance levels are denoted as follows: *p<0.1; **p<0.05; ***p<0.01.

We again find comparable results when substituting the Post dummy with year dummies in Column (3), thereby allowing for a flexible time trend. The joint Wald F-test on the year dummies is highly significant, indicating that there is indeed general year-to-year variation in our data. An examination of the coefficients for the individual years shows a clear general, if not necessarily linear, upward tendency. Most importantly, this hardly affects the interaction variable. It remains statistically significant at the 10%level. In addition, the economic magnitude of the coefficient is close to the results presented in Columns (1) and (2). More precisely, it indicates that universities that participated in the first round of the WPP are about 11.4 percentage points more likely to appoint a female professor than universities that did not participate in the first round of the WPP.

The remaining columns of Table IV-3 use the full sample (n = 827) and thereby analyze the impact of both rounds of the WPP. Column (4) shows the model most comparable to the standard diff-in-diff model. The coefficient of the interaction term *Post (Round 1) x Treated (Round 1)* is statistically significant at the 1% level. This indicates that

universities that participated in the first round of the WPP are about 15.8 percentage points more likely to appoint a female professor than universities that did not. The coefficient of the interaction term *Post (Round 2) x Treated (Round 2)* is also positive (0.05) yet statistically insignificant. This suggests that universities that participated in the first round of the WPP increased the share of newly appointed female professors to a greater degree than those that participated in the second round. We apply a Wald F-test to test whether the coefficients reflecting the first and second rounds are significantly different. With an F-statistic of only 0.69, we cannot reject the null hypothesis that there is no difference in the impact across these two rounds. Hence, we cannot conclude that the program's first round is the only driving force behind the results observed in Column (4) of Table IV-3.

Another noteworthy result of this model is that the *Post (Round 2)* dummy is significantly positive. This implies that independent of whether a university participated in the second round of the program, we observe a 14.9 percentage points increase in the probability of hiring a newly tenured female professor during the 2013-2017 period compared to the pre-program period. This effect was further strengthened by another 15.8 percentage points for universities participating in the second program.

For this reason, we add a linear time trend to the previous model and obtain similar results in Column (5). Again, the linear time trend variable itself is significant and does not surprisingly reduce the point estimate and thereby the significance of the *Post (Round 2)* dummy. More importantly, the coefficient of the interaction term *Post (Round 1) x Treated (Round 1)* remains at a value of 0.152, which is almost as high as before and statistically significant. In addition, the size and significance level of the interaction term capturing the second round stays in the same ballpark as in the previous model. Again, we cannot statistically conclude that the effects differ between the first and second rounds.

To now also allow for a more general time trend, we replace the post dummies with year dummies in the next step. The year dummies are jointly highly significant, and the coefficients and significance levels of the interaction variables, as presented in Column (6),

are comparable to before. Although the point estimate for the first round is higher and significantly different from zero, we again find no statistically significant difference between the two rounds. Hence, the results remain robust when controlling for systematic year-to-year differences in appointment decisions. This strengthens our belief that the findings are truly driven by program universities and neither by non-program universities, nor, for instance, by an overall trend in the likelihood of newly hiring female professors.

Given that we do not have theoretical reasons to believe that the first and second round should differ in their impact and cannot reject the null hypothesis that their effects are the same, we end with a model in which this restriction is imposed. This final model, as shown in Column (7), shows that universities that participated in the WPP were more likely to appoint female professors than universities that did not participate in the program. More precisely, we find that the interaction term coefficient in this final and preferred model is statistically significant at the 10% level. It shows that universities that did participate in either round of the WPP had a 9.8 percentage points increase in the probability of appointing a female professor compared to universities that did not participate in the program.

Overall, these findings provide evidence that universities that participated in the WPP increased the share of newly appointed female professors compared to universities that did not participate in this program. The size of the effect appears to revolve around approximately ten percentage points. Considering that the share of appointments of female professors in our sample is quite low (almost 20%), this effect can be regarded as significant and substantial. Furthermore, the share of newly appointed female professors in our sample is always well below 50% in all of the years.[25] This finding further underlines the relevance of the reported effects. Regarding the WPP's primary objective of increasing the share of female professors, our results suggest that the program has achieved this goal within the business administration discipline.

[25] This is confirmed by Figure IV-1 in the robustness section.

5.2 Publication Records of Newly Tenured Professors

Table IV-4 presents our main results regarding the second research question, in which we analyze whether program universities lowered the entry barrier for female professors in terms of their publication records compared to non-program universities. Whereas the first four columns of Table IV-4 focus on female professors, columns (5)–(8) analyze male professors. All models cover both rounds of the program.

In Column (1) of Table IV-4, we find the coefficient of the interaction term *Post (Round 1) x Treated (Round 1)* to be negative yet statistically insignificant. The point estimate implies an average reduction of 0.14 points in the publication record of a female professor newly appointed at a university participating in the first round. Given that the average value of the *JQL3 Score* is 0.83, this is, in principle, a substantial reduction. In the second round of the program, the point estimate of the interaction term *Post (Round 2) x Treated (Round 2)* becomes even more negative (-0.44) and statistically significant at the 10% level. This indicates that the publication records of female professors who obtained tenure at a university participating in the second round of the program were lower than those of female professors who did not participate. Although the lowering of the entry barrier appears more pronounced in the second round, we cannot state that the effects statistically differ across the two rounds. The Wald F-test for this takes on a value of 0.92 and does not allow us to reject the null hypothesis that both rounds had the same impact on the publication records of the newly appointed female professors.

Column (2) of Table IV-4 extends the model by including a linear time trend. Although this additional variable has the expected positive sign, i.e., the publication records for newly tenured female professors tend to increase, it is not statistically significant. This model produces very similar results to the first model. The coefficient of the interaction term *Post (Round 1) x Treated (Round 1)* is statistically insignificant, whereas the coefficient of the interaction term *Post (Round 2) x Treated (Round 2)* is negative and statistically significant. However, we cannot reject that the coefficients of the treated dummy are equal across the two rounds.

Table IV-4: OLS regressions on the *JQL3 Score* (one-year lead) for female and male professors separately

	Dependent variable: JQL3 Score (one-year lead)							
	Female Professors (1)	Female Professors (2)	Female Professors (3)	Female Professors (4)	Male Professors (5)	Male Professors (6)	Male Professors (7)	Male Professors (8)
Mean LHS	0.8346	0.8346	0.8346	0.8346	1.1305	1.1305	1.1305	1.1305
Standard Deviation LHS	0.7707	0.7707	0.7707	0.7707	0.9711	0.9711	0.9711	0.9711
Post (Round 1) x Treated (Round 1)	*-0.1374*	*-0.1334*	*-0.1934*		*0.1782*	*0.1605*	*0.1587*	
	(0.3042)	*(0.3062)*	*(0.2943)*		*(0.1486)*	*(0.1500)*	*(0.1519)*	
Post (Round 2) x Treated (Round 2)	*-0.4351**	*-0.4509***	*-0.6276****		*0.0103*	*-0.0064*	*0.0102*	
	(0.2231)	*(0.2269)*	*(0.2450)*		*(0.2109)*	*(0.2119)*	*(0.2272)*	
Post x Treated (Combined Rounds)				*-0.4641***				*0.0322*
				(0.2051)				*(0.1332)*
Treated (Round 1)	-0.1504	-0.1662	-0.1808		-0.1260	-0.1006	-0.0844	
	(0.2282)	(0.2392)	(0.2314)		(0.1393)	(0.1424)	(0.1460)	
Treated (Round 2)	0.3105	0.3204	0.6055***		0.0919	0.0829	0.0619	
	(0.1927)	(0.1949)	(0.2183)		(0.1446)	(0.1444)	(0.1440)	
Treated (Combined Rounds)				0.3035				0.1424
				(0.2488)				(0.1484)
Post (Round 1)	0.2815	0.1649			0.0490	-0.0907		
	(0.2621)	(0.3328)			(0.1162)	(0.1313)		
Post (Round 2)	0.2675	0.0781			0.2601	0.0252		
	(0.1952)	(0.3395)			(0.1876)	(0.2133)		
Linear Time Trend		0.0173				0.0207*		
		(0.0255)				(0.0116)		
F Statistic: *Treated (Round 1) = Treated (Round 2) &Post (Round 1) x Treated (Round 1) = Post (Round 2) x Treated (Round 2)*	0.9203	0.9498	2.2013		0.6163	0.4955	0.3343	
Year Dummies	No	No	Yes**	Yes***	No	No	Yes	Yes*
Federal State Dummies	Yes*	Yes*	Yes	Yes	Yes*	Yes*	Yes*	Yes*
Equality Ranking Dummies	Yes	Yes	Yes	Yes	Yes***	Yes**	Yes**	Yes**
University Reputation Dummies	Yes*	Yes*	Yes	Yes*	Yes	Yes	Yes	Yes
Field Dummies	Yes	Yes	Yes	Yes	Yes***	Yes***	Yes***	Yes***
Personal Controls	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***
Observations	156	156	156	156	671	671	671	827
R^2	0.5346	0.5365	0.6243	0.6040	0.3532	0.3558	0.3707	0.3708
F Statistic: Entire Model	3.4160***	3.3279***	2.8571***	2.7733***	8.1647***	8.0550***	5.8817***	6.1036***

Continued on next page

Table IV-4 continued from previous page

Notes: This table shows results from eight OLS regression models. The dependent variable in all of these models is the *JQL3 Score* that we introduce in Section 4.1. In the first four models, we focus only on female professors. Hence, we have 156 observations in these models. The first model displays the standard difference-in-differences approach over both rounds of the WPP. *Post (Round 1)* equals 1 if a professor obtains tenure when the first round of the program is active (2008-2012). *Treated (Round 1)* equals 1 if a professor obtains tenure at a university that participates in the first round of the WPP. *Post (Round 2)* equals 1 if a professor obtains tenure when the second round of the program is active (2013-2017). *Treated (Round 2)* equals 1 if a professor obtains tenure at a university that participates in the second round of the WPP. The interaction term *Post (Round 1) x Treated (Round 1)* then captures the effect of participating in the first round of the WPP on the likelihood that a newly appointed professor is female in comparison to the universities that did not participate in the WPP. The interaction term *Post (Round 2) x Treated (Round 2)* captures the effect of the second round of the WPP on the likelihood that a newly appointed professor is female in comparison to universities that did not participate. In the second model, we add the *Linear Time Trend* to our initial model. In the third model, we include *Year Dummies* for the year in which a respective professor obtains tenure. This absorbs the *Post* dummies. In our fourth and final model, we restrict the impact of both rounds of the WPP to be the same. Therefore, we introduce the dummy variable *Treated (Combined Rounds)* that equals 1 if a professor obtains tenure at a university that participates in either round of the WPP and a dummy variable called *Post (Combined Rounds)* that is simply the sum of the two existing *Post* dummies. The *Year Dummies* in this model absorb this *Post* dummy. For the first, second, and third model, we apply a Wald F-Tests that test whether the coefficients of the treated dummies and the interaction terms of both rounds differ statistically significant from each other. We control for the field of business administration as well as for the federal state, the level of gender equality, the quality of the appointing university, the age at which these professors did obtain their doctorate, the time it took them to tenure, and the number of different coauthors in all models. Again, we apply Wald F-Tests to determine whether each group of control variables differs statistically significant from zero. The stars besides the respective controls indicate the results of the Wald F-Tests. In the fifth, sixth, seventh, and eighth model, we replicate the same steps for the male professors in our sample. In these models, we have 671 observations. We report robust standard errors in parentheses. Significance levels are denoted as follows: *p<0.1; **p<0.05; ***p<0.01.

In Column (3), we replace the *Post* dummies with year dummies. The insignificance of the linear time trend could be due to nonlinearities in the upward trend of the publication records. The year dummies are jointly significant and generally show a clear, albeit nonlinear, upward tendency. The point estimates of this more flexible specification are somewhat stronger, but the significance levels remain in the same order of magnitude. Again, we cannot reject the null hypothesis that the effects of the two rounds are identical.

This brings us to our final specification, in which we restrict the impact of the program to the same across the two rounds. The interaction coefficient is statistically significant and estimated to be -0.46. This indicates that the publication records of women who obtained tenure at program universities have, on average, a lower value than those who obtained tenure at non-program universities when controlling for other factors that explain such differences across types of universities and researchers. As indicated in the top row of Table IV-4, the average score of the newly tenured female professors in our sample is 0.83. The reduction of 0.46 points is therefore quite substantial and, for instance, comparable to an A+ publication (e.g., *Academy of Management Journal*), which two authors have written. Our data reveal that the average female professor publishes about 0.2 A+, 1.2 A, and 4 B publications at the time of receiving tenure (not adjusted for coauthorship). The

estimated interaction coefficient from Column (4) of Table IV-4 translates into a reduction in the entry barrier for female professors of around one single-authored A publication or two single-authored B publications.[26]

Columns (5)–(8) show the four models in which we analyze only male professors in our sample. In each of these models, the interaction term(s) of interest is(are) statistically insignificant. This indicates that the WPP did not affect the publication records of the newly tenured male professors. In other words, the WPP did not raise the entry barrier for males.[27]

In Table IV-5, we pool male and female professors. We include a *Female* dummy, which we interact with the *Treated (Combined Rounds)* and *Post x Treated (Combined Rounds)* dummies to allow the program to have different effects on the publication records of female and male professors. In this model, using the same dependent variable as in Table IV-4, we find that the coefficient of the triple interaction term *Female x Post x Treated (Combined Rounds)* is negative and statistically significant. This result emphasizes that the publication records of female professors who obtained tenure at program universities during the program rounds were significantly lower than those of female professors who obtained tenure during the same period at non-program universities. The *Post x Treated (Combined Rounds)* coefficient is almost zero and statistically insignificant. This further strengthens our finding that the WPP did not affect the publication records of male professors.

[26] This finding can also be inferred from Figure IV-2 in the robustness section. In particular, we see declining publication records during the second round of the WPP among women who obtained tenure at program universities (dark grey line).
[27] Again, we find that our multivariate finding matches the graphical results presented in Figure IV-2 of the robustness section, where we also do not see any impact of the WPP on publication records of male professors.

Table IV-5: OLS regressions on the *JQL3 Score* (one-year lead) for our entire sample

	Dependent variable: JQL3 Score (one-year lead)
	All professors
	(1)
Mean LHS	1.0746
Standard Deviation LHS	0.9433
Treated (Combined Rounds)	0.1133
	(0.1347)
Post x Treated (Combined Rounds)	0.0333
	(0.1346)
Female	-0.4666*
	(0.2534)
Female x Treated (Combined Rounds)	0.3418*
	(0.1831)
Female x Post x Treated (Combined Rounds)	*-0.6115***
	(0.2317)
Year Dummies	Yes*
Female x Year Dummies	Yes
Federal State Dummies	Yes*
Equality Ranking Dummies	Yes*
University Reputation Dummies	Yes**
Field Dummies	Yes***
Personal Controls	Yes***
Observations	827
R^2	0.3918
F Statistic: Entire Model	5.5443***

Notes: This table shows results from one OLS regression model. The dependent variable in this model is the *JQL3 Score* that we introduce in Section 4.1. In this model, we restrict the impact of both rounds of the WPP to be the same. Therefore, we introduce the dummy variable *Treated (Combined Rounds)* that equals 1 if a professor obtains tenure at a university that participates in either round of the WPP and a dummy variable called *Post (Combined Rounds)* that is simply the sum of the two existing post dummies. The *Year Dummies* in this model absorb this *Post* dummy. We interact the *Female* dummy with these dummy variables in order to derive separate effects for female and male professors. We control for the field of business administration as well as for the federal state, the level of gender equality, the quality of the appointing university, the age at which these professors did obtain their doctorate, the time it took them to tenure, and the number of different coauthors in all models. Again, we apply Wald F-Tests to determine whether each group of control variables differs statistically significant from zero. The stars besides the respective controls indicate the results of the Wald F-Tests. We report robust standard errors in parentheses. Significance levels are denoted as follows: *p<0.1; **p<0.05; ***p<0.01.

Another significant coefficient in Table IV-5 is the dummy for women. It is significantly negative (-0.47), suggesting that female professors who have received appointments at non-program universities already publish fewer articles or publish in less highly ranked journals than their male colleagues who have received appointments at similar universities. This difference fits previous literature that shows gender publication gaps in various academic disciplines (Jokinen and Pehkonen 2017), such as economics (Hilber et al. 2021), or medicine and social sciences (Madison and Fahlman 2020). The WPP further exacerbates this discrepancy.

6. Further Analyses

6.1 Robustness Checks

To test the robustness of our findings, we conduct several robustness checks. The dependent variable in our first research question (*Female*) is binary, which the estimation method could have accounted for. However, in our main results, we chose to estimate an LPM over a logit model for reasons of interpretability. To test whether the choice of model affects our results, we re-estimate the models in Table IV-3 using a logit model. Columns (1)–(4) of Table IV-6 present the respective results.[28] We find that all four models yield results that are robust to our initial findings in Table IV-3.

[28] Please note that we only display the results regarding both rounds of the WPP. If we only focus on the first round of the WPP, our results remain robust as well. The results are available upon request.

Table IV-6: Robustness checks on the probability that a newly appointed professor is female

	Dependent variable: Female					
	Logit	Logit	Logit	Logit	Placebo Logit	Placebo LPM
	Round 1 & 2 (1)	Round 1 & 2 (2)	Round 1 & 2 (3)	Round 1 &2 (4)	Round 1 & 2 (5)	Round 1 & 2 (6)
Mean LHS	0.1886	0.1886	0.1886	0.1886	0.1645	0.1645
Post (Round 1) x Treated (Round 1)	*1.1727***	*1.1333***	*1.0449***			
	(0.4648)	*(0.4692)*	*(0.4673)*			
Post (Round 2) x Treated (Round 2)	*0.2901*	*0.2273*	*0.2214*			
	(0.5021)	*(0.5061)*	*(0.5283)*			
Post x Treated (Combined Rounds)				*0.6264**	*0.0013*	*0.0113*
				(0.3546)	*(0.4114)*	*(0.0539)*
Treated (Round 1)	-0.3813	-0.3452	-0.3290			
	(0.3432)	(0.3479)	(0.3534)			
Treated (Round 2)	-0.3214	-0.3242	-0.3454			
	(0.3742)	(0.3734)	(0.3720)			
Treated (Combined Rounds)				-0.5588	-0.4292	-0.0545
				(0.4244)	(0.5245)	(0.0672)
Post (Round 1)	-0.0585	-0.5689				
	(0.3817)	(0.4884)				
Post (Round 2)	1.1486***	0.3367				
	(0.4431)	(0.6610)				
Linear Time Trend		0.0722*				
		(0.0427)				
χ^2: *Treated (Round 1) = Treated (Round 2) & Post (Round 1) x Treated (Round 1) = Post (Round 2) x Treated (Round 2)*	2.2692	2.4186	1.9613			
Year Dummies	No	No	Yes	Yes	Yes	Yes**
Federal State Dummies	Yes	Yes	Yes	Yes	Yes	Yes**
Equality Ranking Dummies	Yes	Yes	Yes	Yes	Yes	Yes*
University Reputation Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Field Dummies	Yes***	Yes***	Yes***	Yes***	Yes	Yes
Personal Controls	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***
Observations	827	827	827	827	687	687
Pseudo R^2	0.1301	0.1338	0.1561	0.1524	0.1566	
AIC	782.69	781.76	799.92	798.83	630.01	
R^2						0.1216
F Statistic: Entire Model						1.5886***

Continued on next page

Table IV-6 continued from previous page

Notes: This table shows results from six regression models. The dependent variable in all of these models is a dummy variable that equals 1 if a newly appointed professor is a woman (*Female*). In the first, second, third, and fourth model, we estimate Logit regressions and focus on both rounds of the WPP. In these models, we have 827 observations. The first model displays the equivalent to the standard difference-in-differences approach over both rounds of the WPP. *Post (Round 1)* equals 1 if a professor obtains tenure when the first round of the program is active (2008-2012). *Treated (Round 1)* equals 1 if a professor obtains tenure at a university that participates in the first round of the WPP. *Post (Round 2)* equals 1 if a professor obtains tenure when the second round of the program is active (2013-2017). *Treated (Round 2)* equals 1, if a professor obtains tenure at a university that participates in the second round of the WPP. The interaction term *Post (Round 1) x Treated (Round 1)* then captures the effect of participating in the first round of the WPP on the likelihood that a newly appointed professor is female in comparison to the universities that did not participate in the WPP. The interaction term *Post (Round 2) x Treated (Round 2)* captures the effect of the second round of the WPP on the likelihood that a newly appointed professor is female in comparison to universities that did not participate. In the second model, we add the *Linear Time Trend* to our initial model. In the third model, we include *Year Dummies* for the year, in which a respective professor obtains tenure. This absorbs the *Post* dummies. In our fourth model, we restrict the impact of both rounds of the WPP to be the same. Therefore, we introduce the dummy variable *Treated (Combined Rounds)* that equals 1 if a professor obtains tenure at a university that participates in either round of the WPP and a dummy variable called *Post (Combined Rounds)* that is simply the sum of the two existing post dummies. In this model the *Year Dummies* absorb this *Post* dummy. In the fifth and sixth model, we estimate placebo regressions as explained in Section 6.1 where we create a placebo program with two rounds that each start four years before the actual two rounds of the WPP. We focus on both rounds of the placebo program. Hence, we have 687 observations in these models. In both models, we restrict the impact of both rounds of the placebo program to be the same. Therefore, we introduce the dummy variable *Treated (Combined Rounds)* that equals 1 if a professor obtains tenure at a university that participates in either round of the placebo program and a dummy variable called *Post (Combined Rounds)* that is simply the sum of the two existing *Post* dummies based on the placebo program. The *Year Dummies* absorb this *Post* dummy. In our fifth model, we estimate a Logit model. In the sixth model, we estimate an LPM. We control for the field of business administration as well as for the federal state, the level of gender equality, the quality of the appointing university, the age at which these professors did obtain their doctorate, the time it took them to tenure, and the number of different coauthors in all models. We apply χ^2-Tests respectively Wald F-Tests to determine whether each group of control variables differs statistically significant from zero. The stars besides the respective controls indicate the results of the χ^2-Tests respectively Wald F-Tests. We report robust standard errors in parentheses. Significance levels are denoted as follows: *p<0.1; **p<0.05; ***p<0.01.

Regarding our second research question, we chose the publication record one year after becoming a professor as our dependent variable. To test whether this choice impacts our conclusions, we re-calculate the *JQL3 Score* without this one-year lead and then re-estimate our final model using such a dependent variable. The results are shown in Column (1) of Table IV-7. The adaptation of the dependent variable does not change any of our conclusions.

The dependent variable is skewed to the right. We test whether this affects our results and apply a logarithmic transformation. To deal with the occasional zeros in the dependent variable, we first add the value of one and then calculate its logarithm. We then re-estimate the regression model. Column (2) of Table IV-7 shows the results, which are robust.

Finally, we employ a widely employed international journal rating instead of the *JQL3 Score* to test whether our results rely crucially on employing this specific journal rating. In particular, we use the Source Normalized Impact per Paper (*SNIP*) (Moed 2010; Waltman et al. 2013), which has been previously used in comparable analyses (e.g., Salter et al. (2017)). More precisely, we calculate a score similar to the previously used

JQL3 Score, with the difference that we use a broader list of journals[29] and weights based on *SNIP*[30]. As shown in Column (3) of Table IV-7, our results remain robust as we re-estimate our regression models with this new dependent variable.

Table IV-7: Robustness checks on the publication records

Dependent variable:	*JQL3 Score* (no lead)	*Log(1+JQL3 Score* (one-year lead)*)*	*SNIP Score* (one-year lead)	*JQL3 Score* (one-year lead)
	All professors (1)	All professors (2)	All professors (3)	Placebo Test All professors (4)
Mean LHS	0.9118	0.6430	1.0038	1.0146
Standard Deviation LHS	0.7981	0.4070	1.0916	0.8839
Treated (Combined Rounds)	0.0628	0.0180	0.0729	0.1553
	(0.1141)	(0.0545)	(0.1201)	(0.1326)
Post x Treated (Combined Rounds)	0.0197	0.0111	0.1534	-0.1006
	(0.1180)	(0.0507)	(0.1423)	(0.1221)
Female	-0.3650*	-0.2712**	-0.1135	-0.0629
	(0.2059)	(0.1159)	(0.2762)	(0.2763)
Female x Treated (Combined Rounds)	0.2538*	0.1517*	0.1822	-0.0935
	(0.1468)	(0.0852)	(0.2045)	(0.2589)
Female x Post x Treated (Combined Rounds)	*-0.4622***	*-0.2644***	*-0.6081***	*0.2709*
	(0.1833)	*(0.1044)*	*(0.2784)*	*(0.2750)*
Year Dummies	Yes*	Yes**	Yes***	Yes***
Female x Year Dummies	Yes	Yes	Yes	Yes
Federal State Dummies	Yes**	Yes**	Yes*	Yes**
Equality Ranking Dummies	Yes	Yes***	Yes*	Yes***
University Reputation Dummies	Yes**	Yes**	Yes***	Yes
Field Dummies	Yes***	Yes***	Yes***	Yes***
Personal Controls	Yes***	Yes***	Yes***	Yes***
Observations	827	827	827	687
R^2	0.3586	0.4370	0.5167	0.4081
F Statistic	5.0735***	7.0431***	9.6983***	5.7022***

Continued on next page

[29] The journal list of *SNIP* weights consists of the previously used *Jourqual 3* list and is expanded by journals listed in the ERIM Journal List (EJL), the Association of Business Schools (ABS) Academic Journal Guide 2015, and a collection of Web of Science SCI and SSCI journals listed in the categories 'Operations Research & Management Science', 'Business', 'Business & Finance', 'Industrial Relations & Labor', 'Management' and 'Public Administration'.

[30] *SNIP* weights are normalized and a weighting scheme is created according to the methodology in Sturm and Ursprung (2017).

Table IV-7 continued from previous page

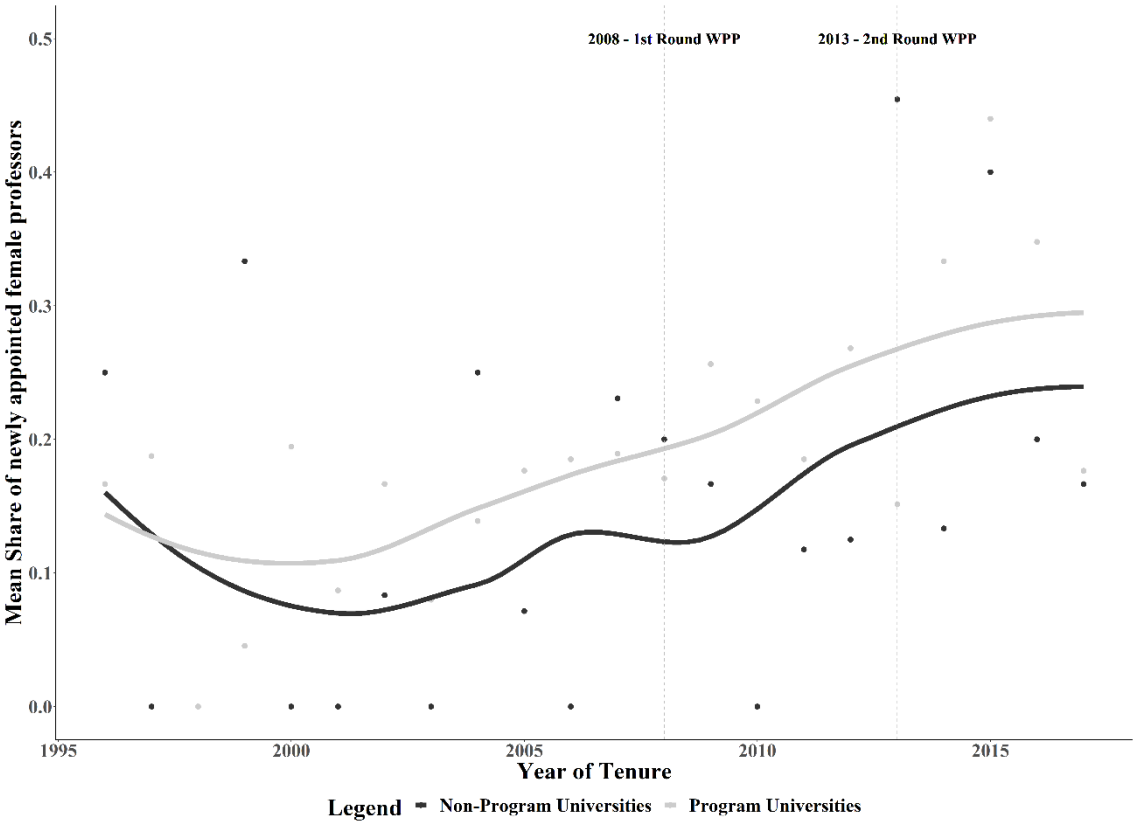
Notes: This table shows results from five OLS regression models. The dependent variable in the first model is the *JQL3 Score* without the one-year lead that we introduce in Section 6.1. The dependent variable in the second model is a logarithmic transformation of the *JQL3 Score* that we introduce in Section 6.1. The dependent variable in the third model is the *SNIP Score* with a one-year lead that we introduce in Section 6.1 In all models, we restrict the impact of both rounds of the WPP to be the same. Therefore, we introduce the dummy variable *Treated (Combined Rounds)* that equals 1 if a professor obtains tenure at a university that participates in either round of the WPP and a dummy variable called *Post (Combined Rounds)* that is simply the sum of the two existing *Post* dummies. The *Year Dummies* absorb this *Post* dummy. Furthermore, we interact the *Female* dummy with these dummy variables in order to derive separate effects for female and male professors. In the fourth model, we estimate placebo regressions as explained in Section 6.1 where we create a placebo program with two rounds that each start four years before the actual two rounds of the WPP. We focus on both rounds of the placebo program. Hence, we have 687 observations in these models. In both models, we restrict the impact of both rounds of the placebo program to be the same. Therefore, we introduce the dummy variable *Treated (Combined Rounds)* that equals 1 if a professor obtains tenure at a university that participates in either round of the placebo program and a dummy variable called *Post (Combined Rounds)* that is simply the sum of the two existing post dummies based on the placebo program. The *Year Dummies* absorb this *Post* dummy. We control for the field of business administration as well as for the federal state, the level of gender equality, the quality of the appointing university, the age at which these professors did obtain their doctorate, the time it took them to tenure, and the number of different coauthors in all models. Again, we apply Wald F-Tests to determine whether each group of control variables differs statistically significant from zero. The stars besides the respective controls indicate the results of the Wald F-Tests. We report robust standard errors in parentheses. Significance levels are denoted as follows: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$.

6.2 Parallel Trends

The identification strategy of the diff-in-diff approach, in general, relies on the idea that the treatment and control groups would have continued to follow the same trend in the absence of the investigated treatment. To investigate whether this assumption holds in our specific setting, we follow De Paola et al. (2014) and provide two tests for each research question. First, we graphically show the parallel trends. Second, we implement a placebo program using data from before the actual implementation of the WPP.

Figure IV-1 shows the yearly average share of newly appointed female university professors who participated in the WPP (grey dots) and those who did not participate (black dots). We find that the yearly values are quite volatile, primarily caused by the small samples in each group and year. To provide less volatile values, we display non-parametric regression lines in addition to yearly values. Except for the beginning of our observation period, the non-parametric regression lines display parallel trends before implementing the WPP. However, given the small sample size, we believe we should interpret the values at the beginning of our observation period cautiously and assume that the parallel trend assumption holds in our setting.

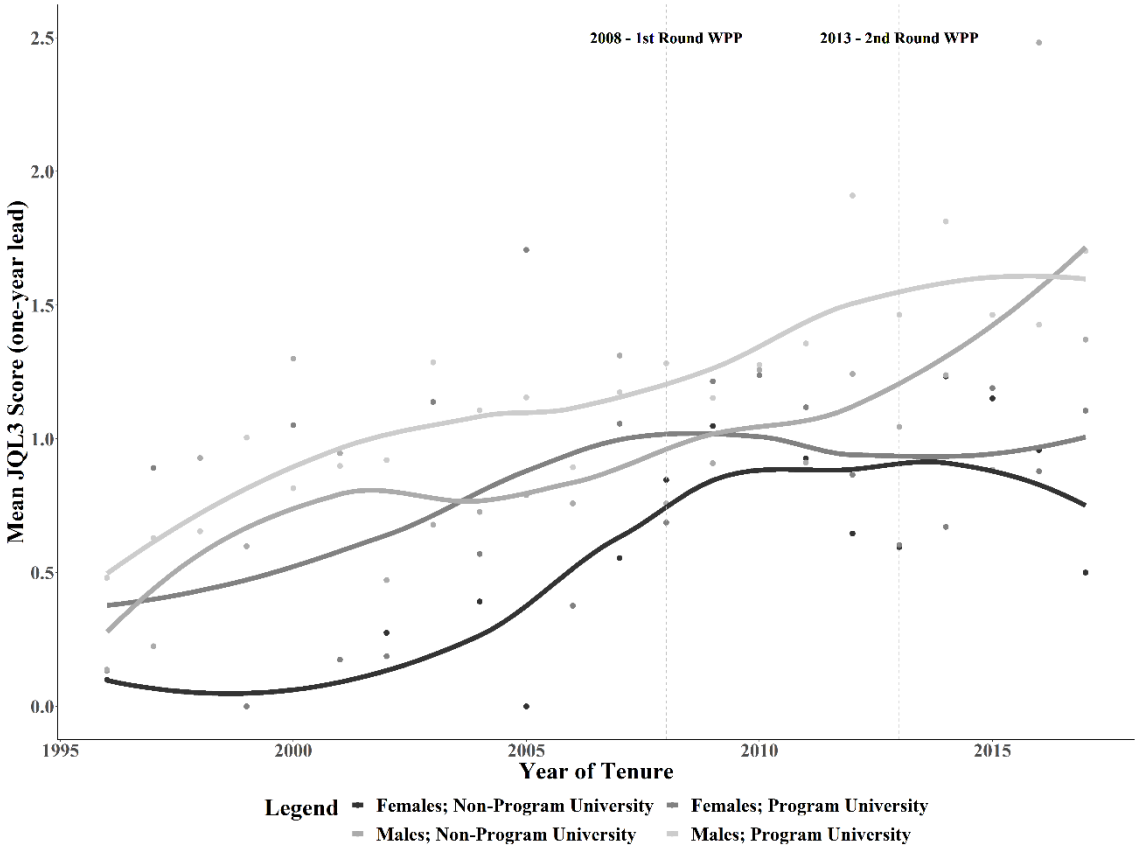
Figure IV-1: Mean share of newly appointed female professors by status of university and year of tenure.



Notes: We split our sample into two groups. First, universities that (will) participate in the program, i.e. program universities (grey line). Second, universities that do not/will not participate in the program, i.e. non-program universities (black line). Next, we display the yearly average share of newly appointed female professors by group (colored dots). Finally, we show non-parametric regression lines for both groups (colored lines).

Figure IV-2 shows the yearly average publication records of female and male professors appointed by the program and non-program universities. When we focus on the female professors in this figure, we notice that the publication records show parallel trends before the introduction of the WPP. The dark grey (women at program universities) and the black line (women at non-program universities) have almost identical slopes until the WPP started in 2008. We also notice parallel trends for male professors in our sample.

Figure IV-2: Mean *JQL3 Score* (one-year lead) by gender, status of university and cohort



Notes: We split our sample into four groups. First, female professors, who obtained tenure at program universities (dark grey line). Second, female professors, who obtained tenure at non-program universities (black line). Third, male professors, who obtained tenure at program universities (light grey line). Fourth, male professors who obtained tenure at non-program universities (medium grey line). Next, we display the yearly *JQL3 Score* (one-year lead) of the newly appointed professors by group (grey scaled dots). Finally, we show non-parametric regression lines for all four groups (grey scaled lines).

Finally, we create a placebo program to show that our results relate to the WPP and not to a general time trend. We do so by advancing the treatment period by four years. Therefore, we pretend that the first program round lasted from 2004 to 2008 and the second round from 2009 to 2013 instead of 2008-2012, and 2013-2017, respectively. In addition, we restrict our sample to 1996–2013, which corresponds to the end of our hypothetical treatment period. We re-estimate our LPM and logit models, respectively, OLS regression models, regarding the first and second research questions with this new specification.[31] In this setup, the coefficient of the interaction term is not only smaller but also insignificant

[31] We provide the results regarding our first research question in Columns (5) and (6) of Table IV-6. The results regarding our second research questions can be found in Column (4) of Table IV-7.

in all settings. These findings differ from the results presented in Sections 5.1 and 5.2, indicating that our results are likely to be caused by the program and not by coincidence.

7. Discussion and Conclusion

This study analyzes the effect of the Women Professors Program (WPP) on female business administration professors in Germany. This affirmative action program aims to improve gender equality in the higher education sector in Germany and offers financial incentives for universities to appoint female professors. We focused on two research questions: First, we investigated whether the WPP increased the probability that a newly tenured professor is female at program universities compared to non-program universities. Second, we focus on publication records and analyze whether universities accepted into the WPP lower their publication requirements for newly tenured female professors as opposed to other universities.

Our results show that at universities that participated in the WPP, the probability of a newly tenured business administration professor is substantially higher compared to universities that did not participate in the WPP. Our econometric models indicate that this effect's magnitude revolves around ten percentage points. Given that the share of female professors overall is relatively low in our sample (approximately 20%), this increase can be considered meaningful. Regarding the aim of the program to increase the share of newly appointed female professors, our results provide evidence that the program was successful in business administration.

Löther (2019b), who analyzed the WPP across all academic disciplines, came to a similar conclusion, that is, that program universities appoint more female professors than non-program universities, as what would have been expected without the program. Yet, our study contributes to the literature in many ways. *First*, our empirical approach differs from the approach of Löther (2019b) insofar as she calculates the quotas of female professors before and after the program, which means that every (already tenured) professor is included in her sample. In contrast, we analyzed only newly appointed professors without

focusing on the existing population of professors. Thus, our approach provides more precise estimates of the effect of the WPP on newly tenured professors. *Second*, in our empirical analyses, we control for essential aspects that are likely to be correlated with the probability of hiring a newly tenured female professor: most notably, the reputation of the appointing university; thus, also in this way, we provide more precise estimates of the net effect of the program. *Third*, and most importantly, our study contributes to the literature by providing new insights into the mechanisms of the program by analyzing the publication records of newly tenured business administration professors. Hence, the scope of this study's insights is wider than that of Löther (2019b) and we can provide an answer to the question of how program universities achieve higher quotas for female professorships.

Regarding this second research question, we found that the publication records of women who obtained tenure at program universities were lower than those of women who obtained tenure at non-program universities around the same time. This result is interesting as it indicates that universities that participated in the WPP took affirmative action measures by lowering the entry barrier for junior female researchers in business administration. At the same time, we did not find significant effects on the publication records of newly tenured men.

Although we should not overinterpret our results, our impression is that over time it has become more difficult for this program to record success.[32] Table IV-3 suggests that it became harder to recruit female professors within this program across the two programs. Table IV-4 suggests that the decline in publication standards at program universities became more pronounced during the second round. One possible interpretation is that to be still able to report some successful female appointments within this program, universities were forced to lower their publication standards further. However, our results are only limited to the discipline of business administration and might not apply to other academic disciplines.

[32] Also, this goes beyond the findings presented by Löther (2019b).

Admittedly, arguing that lowering publication requirements for female researchers constitutes the entirety of affirmative action measures observed through the implementation of the WPP might be exaggerated. Nevertheless, past research (e.g., Bajo et al. (2020); Jungbauer-Gans and Gross (2013); Lutter and Schröder (2016)) shows that publications in peer-reviewed journals are the most important determinants of hiring and promotion in academia. We do not exclude the possibility that universities change how qualities outside published work, such as the acquisition of external funds or teaching performance, are weighted in the hiring process. Putting more emphasis on teaching duties or committee work may constitute a form of affirmative action, as it has been shown that gender differences exist along the distribution of these tasks (Babcock et al. 2017; Misra et al. 2012; Mitchell and Hesli 2013). However, we are not able to measure these merits of these professors. Given our high-quality data, we can precisely proxy the quality of the publication records and thus focus on this measure of academic performance.

Our evaluation of the program shows that through financial incentives, universities were motivated to create gender equality plans tailored to each university's needs. These gender equality plans led to affirmative action in the hiring process of the newly tenured professors. Affirmative action was observed to affect young female researchers concerning publication requirements when receiving tenure without affecting publication requirements for young male researchers. Most of the initiatives investigated thus far, such as tenure-clock-stopping policies (Antecol et al. 2018), gender quotas in scientific evaluation committees (Bagues et al. 2017), and dual-career policies (Juraqulova et al. 2019), do not apply financial incentives. Such policies have yielded mixed results with respect to their effectiveness. However, our results provide evidence that financial incentives trigger universities to address gender-related questions.

Our study has some limitations. First, we do not know exactly which female professor obtained tenure as a direct result of the WPP. In other words, there is no information on the appointment for which a university receives direct funding. However, we believe this is not crucial for our study, as we see gender equality concepts affecting the whole university

as the driving force.[33] Consequently, we believe that the program affects not only individual appointments but also the appointing culture of a university.

Second, unfortunately, we could not approximate the competition each professor faced when obtaining tenure, that is, the publication records of other applicants. For example, the competition faced at universities participating in the WPP could—for some other reason, not captured by our controls—suddenly fall, allowing these universities to accept applicants to tenured positions with weaker publication records. This may explain the results of this study. However, anecdotal evidence suggests that tenured positions at universities taking part in the program and other universities are coveted positions, mostly chosen from the same pool of applicants. Furthermore, the fact that we only observed effects on the publication bar of female professors and not on their male colleagues strengthens our belief that the observed effects stem from affirmative action motives and not from a lack of competition at program universities.

Third, data were collected at the end of 2018. Hence, it is possible that some professors obtained tenure in 2008 (or any other year before 2018) but left the DACH region before 2018. Technically, we cannot include such individuals in our sample. This might have confounded our results. However, anecdotal evidence suggests that only a few tenured professors have left the higher education system in the DACH region. Therefore, we believe that this limitation did not substantially affect the results.

Furthermore, it would be interesting to analyze the impact of the WPP over a longer period. First, this would increase our sample size, which is not particularly large when we focus on female professors. Second, a longer observation period provides an opportunity to focus on the long-term effects of the WPP. As the second round of the WPP ended in 2017 and we collected all our data at the end of 2018, there was not enough time between the end of the program and our data collection to derive any meaningful conclusions regarding the long-term effect of the WPP. However, this can be a task for future research.

[33] If anything, it makes it more difficult for us to find significant effects.

Despite these limitations, this study makes valuable contributions to the literature on gender equality in the higher education sector. In particular, we add to the affirmative action literature by exploring a new policy that aims to break the glass ceiling in the academic labor market. In particular, we provide evidence that the WPP accomplished its goals in the academic discipline of business administration. In addition, we explored the mechanism behind the WPP and found that the goal of the program was, at least partly, achieved through affirmative action policies. Program universities lower the entry barrier for female professors while not affecting the requirements for male professors. The finding that one group profits from affirmative action, while the other group is unaffected with regard to the entry barrier for a tenured professorship, might contribute to broader acceptance of the program. The high acceptance of the WPP within the academic community in Germany is also underscored by the fact that many universities have applied to participate in the program. Thus, the program might be a role model for policymakers worldwide who attempt to provide a more gender-equal workplace environment. Our study shows that using financial incentives to encourage institutions to implement affirmative action policies by creating gender equality concepts can help change institutions from within. In addition, by simultaneously increasing acceptance, this approach contrasts with externally imposed policies.

8. References

Aldrich, Andrea S., and William T. Daniel. 2020. The consequences of quotas: Assessing the effect of varied gender quotas on legislator experience in the European parliament. *Politics & Gender* 16: 738–767.

Allen, Peter, David Cutts, and Rosie Campbell. 2016. Measuring the quality of politicians elected by gender quotas – are they any different? *Political Studies* 64 (1): 143–163.

Antecol, Heather, Kelly Bedard, and Jenna Stearns. 2018. Equal but inequitable: Who benefits from gender-neutral tenure clock stopping policies? *American Economic Review* 108 (9): 2420–2441.

Ayaita, Adam, Kerstin Pull, and Uschi Backes-Gellner. 2019. You get what you 'pay' for: academic attention, career incentives and changes in publication portfolios of business and economics researchers. *Journal of Business Economics* 89 (3): 273–290.

Babcock, Linda, Maria P. Recalde, Lise Vesterlund, and Laurie Weingart. 2017. Gender differences in accepting and receiving requests for tasks with low promotability. *American Economic Review* 107 (3): 714–747.

Backes-Gellner, Uschi, Agnes Bäker, and Kerstin Pull. 2018. The opportunity costs of becoming a dean: Does leadership in academia crowd out research? *Schmalenbach Business Review* 70 (2): 189–208.

Bagde, Surendrakumar, Dennis Epple, and Lowell Taylor. 2016. Does affirmative action work? Caste, gender, college quality, and academic success in India. *American Economic Review* 106 (6): 1495–1521.

Bagues, Manuel, and Pamela Campa. 2021. Can gender quotas in candidate lists empower women? Evidence from a regression discontinuity design. *Journal of Public Economics* 194.

Bagues, Manuel, Mauro Sylos-Labini, and Natalia Zinovyeva. 2017. Does the gender composition of scientific

committees matter? *American Economic Review* 107 (4): 1207–1238.

Bajo, Emanuele, Massimiliano Barbi, and David Hillier. 2020. Where should I publish to get promoted? A finance journal ranking based on business school promotions. *Journal of Banking & Finance* 114.

Bäker, Agnes. 2015. Non-tenured postdoctoral researchers' job mobility and research output: An analysis of the role of research discipline, department size, and coauthors. *Research Policy* 44 (3): 634–650.

Bäker, Agnes, Susanne Breuninger, Julia Muschallik, Kerstin Pull, and Uschi Backes-Gellner. 2016. Time to go? (Inter)National mobility and appointment success of young academics. *Schmalenbach Business Review* 17 (3-4): 401–421.

Balafoutas, Loukas, Brent J. Davis, and Matthias Sutter. 2016. Affirmative action or just discrimination? A study on the endogenous emergence of quotas. *Journal of Economic Behavior & Organization* 127: 87–98.

Balafoutas, Loukas, Rudolf Kerschbamer, and Matthias Sutter. 2012. Distributional preferences and competitive behavior. *Journal of Economic Behavior & Organization* 83-334 (1): 125–135.

Baltrunaite, Audinga, Piera Bello, Alessandra Casarico, and Paola Profeta. 2014. Gender quotas and the quality of politicians. *Journal of Public Economics* 118: 62–74.

Bayer, Amanda, and Cecilia E. Rouse. 2016. Diversity in the economics profession: A new attack on an old problem. *Journal of Economic Perspectives* 30 (4): 221–242.

Beaman, Lori, Esther Duflo, Rohini Pande, and Petia Topalova. 2012. Female leadership raises aspirations and educational attainment for girls: A policy experiment in India. *Science* 335 (6068): 582–586.

Bennouri, Moez, Chiara de Amicis, and Sonia Falconieri. 2020. Welcome on board: A note on gender quotas regulation in Europe. *Economics Letters* 190.

Bergmann, Nadja, Alexandra Scheele, and Claudia Sorger. 2019. Variations of the same? A sectoral analysis of the gender pay gap in Germany and Austria. *Gender, Work & Organization* 26 (5): 668–687.

Bertrand, Marianne, Sandra E. Black, Sissel Jensen, and Adriana Lleras-Muney. 2019. Breaking the glass ceiling? The effect of board quotas on female labour market outcomes in Norway. *The Review of Economic Studies* 86: 191–239.

Bertrand, Marianne, Claudia Goldin, and Lawrence F. Katz. 2010. Dynamics of the gender gap for young professionals in the financial and corporate sectors. *American Economic Journal: Applied Economics* 2 (3): 228–255.

Bertrand, Marianne, and Kevin F. Hallock. 2001. The gender gap in top corporate jobs. *ILR Review* 55 (1): 3–21.

Besley, Timothy, Olle Folke, Torsten Persson, and Johanna Rickne. 2017. Gender quotas and the crisis of the mediocre man: Theory and evidence from Sweden. *American Economic Review* 107 (8): 2204–2242.

Blau, Francine D., and Lawrence M. Kahn. 2013. Female labor supply: Why is the United States falling behind? *American Economic Review* 103 (3): 251–256.

Booth, Alison L. 2009. Gender and competition. *Labour Economics* 16 (6): 599–606.

Braga, Michela, and Francesco Scervini. 2017. The performance of politicians: The effect of gender quotas. *European Journal of Political Economy* 46: 1–14.

Bukstein, Daniel, and Néstor Gandelman. 2019. Glass ceilings in research: Evidence from a national program in Uruguay. *Research Policy* 48 (6): 1550–1563.

Calsamiglia, Caterina, Jörg Franke, and Pedro Rey-Biel. 2013. The incentive effects of affirmative action in a real-effort tournament. *Journal of Public Economics* 98: 15–31.

Card, David, Stefano DellaVigna, Patricia Funk, and Nagore Iriberri. 2020. Are referees and editors in economics gender neutral? *The Quarterly*

Journal of Economics 135 (1): 269–327.

Clermont, Marcel. 2016. Effectiveness and efficiency of research in Germany over time: an analysis of German business schools between 2001 and 2009. *Scientometrics* 108 (3): 1347–1381.

Combes, Pierre-Philippe, Laurent Linnemer, and Michael Visser. 2008. Publish or peer-rich? The role of skills and networks in hiring economics professors. *Labour Economics* 15 (3): 423–441.

Corsi, Marcella, Carlo D'Ippoliti, and Giulia Zacchia. 2018. A case study of pluralism in economics: The heterodox glass ceiling in Italy. *Review of Political Economy* 30 (2): 172–189.

Davidson-Schmich, Louise K. 2006. Implementation of political party gender quotas. *Party Politics* 12 (2): 211–232.

De Paola, Maria, Michela Ponzo, and Vincenzo Scoppa. 2018. Are men given priority for top jobs? Investigating the glass ceiling in Italian academia. *Journal of Human Capital* 12 (3): 475–503.

De Paola, Maria, Vincenzo Scoppa, and Marco A. de Benedetto. 2014. The impact of gender quotas on electoral participation: Evidence from Italian municipalities. *European Journal of Political Economy* 35: 141–157.

Dupas, Pascaline, Alicia S. Modestino, Muriel Niederle, Justin Wolfers, and The S. D. Collective. 2021. Gender and the dynamics of economics seminars. *NBER Working Paper Series*.

Eisend, Martin. 2011. Is VHB-JOURQUAL2 a good measure of scientific quality? Assessing the validity of the major business journal ranking in German-speaking countries. *Business Research* 4 (2): 241–274.

Fang, Hanming, and Andrea Moro. 2011. Chapter 5 - Theories of statistical discrimination and affirmative action: A survey. In *Handbook of Social Economics*, eds. Jess Benhabib, Alberto Bisin, Matthew O. Jackson, 133–200. North-Holland: Elsevier.

Fitzenberger, Bernd, Reinhold Schnabel, and Gaby Wunderlich. 2004. The

gender gap in labor market participation and employment: A cohort analysis for West Germany. *Journal of Population Economics* 17 (1): 83–116.

Gayle, George-Levi, Limor Golan, and Robert A. Miller. 2012. Gender differences in executive compensation and job mobility. *Journal of Labor Economics* 30 (4): 829–872.

Geys, Benny, and Rune J. Sørensen. 2019. The impact of women above the political glass ceiling: Evidence from a Norwegian executive gender quota reform. *Electoral Studies* 60.

Gneezy, Uri, Muriel Niederle, and Aldo Rustichini. 2003. Performance in competitive environments: Gender differences. *The Quarterly Journal of Economics* 118 (3): 1049–1074.

Goldin, Claudia, and Cecilia E. Rouse. 2000. Orchestrating impartiality: The impact of "blind" auditions on female musicians. *American Economic Review* 90 (4): 715–741.

GWK Gemeinsame Wissenschaftskonferenz. 2019. *Chancengleichheit in Wissenschaft und Forschung: 23. Fortschreibung des Datenmaterials (2017/2018) zu Frauen in Hochschulen und außerordentlichen Forschungseinrichtungen.* https://www.gwk-bonn.de/dokumente/archiv. Accessed 19 March 2021.

Heckman, James J., and Sidharth Moktan. 2020. Publishing and promotion in economics: The tyranny of the top five. *Journal of Economic Literature* 58 (2): 419–470.

Hellevik, Ottar. 2009. Linear versus logistic regression when the dependent variable is a dichotomy. *Quality & Quantity* 43 (1): 59–74.

Hilber, Simon, Jan-Egbert Sturm, and Heinrich W. Ursprung. 2021. Frauenanteil und geschlechtsspezifische Produktivitätsunterschiede in der volkswirtschaftlichen Forschung. *Perspektiven der Wirtschaftspolitik* 22 (2): 156–171.

Hirsch, Boris. 2013. The impact of female managers on the gender pay gap: Evidence from linked employer–employee data for Germany. *Economics Letters* 119 (3): 348–350.

Hunt, Jennifer. 2002. The transition in East Germany: When is a ten-point

fall in the gender wage gap bad news? *Journal of Labor Economics* 20 (1): 148–169.

Jokinen, Juho, and Jaakko Pehkonen. 2017. Promotions and earnings – gender or merit? Evidence from longitudinal personnel data. *Journal of Labor Research* 38 (3): 306–334.

Jungbauer-Gans, Monika, and Christiane Gross. 2013. Determinants of success in university careers: Findings from the German academic labor market. *Zeitschrift für Soziologie* 42 (1): 74–92.

Juraqulova, Zarrina H., Jill J. McCluskey, and Ron C. Mittelhammer. 2019. Work–life policies and female faculty representation in US doctoral-granting economics departments. *Industrial Relations Journal* 50 (2): 168–196.

Kirsch, Anja. 2017. Women's access to boards in Germany - regulation and symbolic change. In *Gender Diversity in the Boardroom: Volume 1: The Use of Different Quota Regulations*, eds. Catherine Seierstad, Patricia Gabaldon, Heike Mensi-Klarbach, 205–232. Cham: Palgrave Macmillan.

Lassébie, Julie. 2020. Gender quotas and the selection of local politicians: Evidence from French municipal elections. *European Journal of Political Economy* 62: 101842.

Lavy, Victor. 2008. Do gender stereotypes reduce girls' or boys' human capital outcomes? Evidence from a natural experiment. *Journal of Public Economics* 92 (10-11): 2083–2105.

Little, Roderick J. A. 1988. Missing-data adjustments in large surveys. *Journal of Business & Economic Statistics* 6 (3): 287–296.

Löther, Andrea. 2019a. *Hochschulranking nach Gleichstellungsaspekten 2019*. GESIS - Leibniz-Institut für Sozialwissenschaften Kompetenzzentrum Frauen in Wissenschaft und Forschung (CEWS). Köln. https://www.ssoar.info/ssoar/handle/document/64113.

Löther, Andrea. 2019b. Is it working? An impact evaluation of the German "Women Professors Program". *Social Sciences* 8 (4): 116.

Löther, Andrea, and Sabrina Glanz. 2017. *Evaluation des Professorinnenprogramms des Bundes und der Länder: zweite Programmphase und Gesamtevaluation; Erweiterter Bericht.* Köln. https://nbn-resolving.org/urn:nbn:de:0168-ssoar-54112-9. Accessed 04 June 2020.

Lundberg, Shelly, and Jenna Stearns. 2019. Women in economics: stalled progress. *Journal of Economic Perspectives* 33 (1): 3–22.

Lutter, Mark, and Martin Schröder. 2016. Who becomes a tenured professor, and why? Panel data evidence from German sociology, 1980–2013. *Research Policy* 45 (5): 999–1013.

Machin, Stephen, and Patrick A. Puhani. 2003. Subject of degree and the gender wage differential: evidence from the UK and Germany. *Economics Letters* 79 (3): 393–400.

Madison, Guy, and Pontus Fahlman. 2020. Sex differences in the number of scientific publications and citations when attaining the rank of professor in Sweden. *Studies in Higher Education*: 1–22.

Maggian, Valeria, Natalia Montinari, and Antonio Nicolò. 2020. Do quotas help women to climb the career ladder? A laboratory experiment. *European Economic Review* 123.

Manchester, Colleen F., Lisa M. Leslie, and Amit Kramer. 2010. Stop the clock policies and career success in academia. *American Economic Review* 100 (2): 219–223.

Manchester, Colleen F., Lisa M. Leslie, and Amit Kramer. 2013. Is the clock still ticking? An evaluation of the consequences of stopping the tenure clock. *ILR Review* 66 (1): 3–31.

Mateos de Cabo, Ruth, Siri Terjesen, Lorenzo Escot, and Ricardo Gimeno. 2019. Do 'soft law' board gender quotas work? Evidence from a natural experiment. *European Management Journal* 37 (5): 611–624.

Matsa, David A., and Amalia R. Miller. 2013. A female style in corporate leadership? Evidence from quotas. *American Economic Journal: Applied Economics* 5 (3): 136–169.

McGee, Andrew, Peter McGee, and Jessica Pan. 2015. Performance pay, competitiveness, and the gender

wage gap: Evidence from the United States. *Economics Letters* 128: 35–38.

Misra, Joya, Jennifer H. Lundquist, and Abby Templer. 2012. Gender, work time, and care responsibilities among faculty. *Sociological Forum* 27 (2): 300–323.

Mitchell, Sara M., and Vicki L. Hesli. 2013. Women don't ask? Women don't say no? Bargaining and service in the political science profession. *PS: Political Science & Politics* 46 (2): 355–369.

Moed, Henk F. 2010. Measuring contextual citation impact of scientific journals. *Journal of Informetrics* 4 (3): 265–277.

Müller, Christoph E., and Maria Albrecht. 2016. The Future of impact evaluation is rigorous and theory-driven. In *The Future of Evaluation. Global Trends, New Challenges, Shared Perspectives*, eds. Reinhard Stockmann, Wolfgang Meyer, 283–293. New York: Basingstoke, Hampshire: Palgrave Macmillan.

Murray, Rainbow. 2010. Second among unequals? A study of whether France's "quota women" are up to the job. *Politics & Gender* 6 (01): 93–118.

Neumark, David. 2018. Experimental research on labor market discrimination. *Journal of Economic Literature* 56 (3): 799–866.

Niederle, Muriel, Carmit Segal, and Lise Vesterlund. 2013. How costly is diversity? Affirmative action in light of gender differences in competitiveness. *Management Science* 59 (1): 1–16.

Niederle, Muriel, and Lise Vesterlund. 2007. Do women shy away from competition? Do men compete too much? *The Quarterly Journal of Economics* 122 (3): 1067–1101.

Niederle, Muriel, and Lise Vesterlund. 2010. Explaining the gender gap in math test scores: The role of competition. *Journal of Economic Perspectives* 24 (2): 129–144.

Park, Sanghee. 2020. Seeking changes in ivory towers: The impact of gender quotas on female academics in higher education. *Women's Studies International Forum* 79.

Perna, Laura W. 2005. Sex differences in faculty tenure and promotion: The contribution of family ties. *Research in Higher Education* 46 (3): 277–307.

Rauber, Michael, and Heinrich W. Ursprung. 2008. Life cycle and cohort productivity in economic research: The case of Germany. *German Economic Review* 9 (4): 431–456.

Riach, P. A., and J. Rich. 2002. Field experiments of discrimination in the market place. *The Economic Journal* 112 (483): F480-F518.

Röbken, Heinke. 2009. Career paths of German business administration academics. *German Journal of Human Resource Management* 23 (3): 219–236.

Rubin, Donald B. 1986. Statistical matching using file concatenation with adjusted weights and multiple imputations. *Journal of Business & Economic Statistics* 4 (1): 87–94.

Sabatier, Mareva. 2010. Do female researchers face a glass ceiling in France? A hazard model of promotions. *Applied Economics* 42: 2053–2062.

Salter, Ammon, Rossella Salandra, and James Walker. 2017. Exploring preferences for impact versus publications among UK business and management academics. *Research Policy* 46 (10): 1769–1782.

Schrader, Ulf, and Thorsten Henning-Thurau. 2009. VHB-JOURQUAL2: Method, results, and implications of the German Academic Association for Business Research's journal ranking. *Business Research* 2 (2): 180–204.

Schulze, Günther G., Susanne Warning, and Christian Wiermann. 2008. What and how long does it take to get tenure? The case of economics and business administration in Austria, Germany and Switzerland. *German Economic Review* 9 (4): 473–505.

Statistisches Bundesamt (Destatis). 2020. *Studierende an Hochschulen - Fachserie 11 Reihe 4.1 - Sommersemester 2019.*

Sturm, Jan-Egbert, and Heinrich W. Ursprung. 2017. The Handelsblatt Rankings 2.0: Research rankings for the economics profession in Austria,

Germany, and Switzerland. *German Economic Review* 18 (4): 492–515.

Treviño, Len J., Luis R. Gomez-Mejia, David B. Balkin, and Franklin G. Mixon. 2018. Meritocracies or masculinities? The differential allocation of named professorships by gender in the academy. *Journal of Management* 44 (3): 972–1000.

U.S. Glass Ceiling Commission. 1995. *Glass Ceiling Commission - Good for Business: Making Full Use of the Nation's Human Capital*. Washington, DC.

Vink, Gerko, Laurence E. Frank, Jeroen Pannekoek, and Stef van Buuren. 2014. Predictive mean matching imputation of semicontinuous variables. *Statistica Neerlandica* 68 (1): 61–90.

Waltman, Ludo, Nees J. van Eck, Thed N. van Leeuwen, and Martijn S. Visser. 2013. Some modifications to the SNIP journal impact indicator. *Journal of Informetrics* 7 (2): 272–285.

Weeks, Ana C., and Lisa Baldez. 2015. Quotas and qualifications: the impact of gender quota laws on the qualifications of legislators in the Italian parliament. *European Political Science Review* 7 (1): 119–144.

Weichselbaumer, Doris, and Rudolf Winter-Ebmer. 2007. The effects of competition and equal treatment laws on gender wage differentials. *Economic Policy* 22 (50): 236–387.

Wooldridge, Jeffrey M. 2010. *Econometric analysis of cross section and panel data*. MIT press.

Zacchia, Giulia. 2020. What does it take to be top women economists? An analysis using rankings in RePEc. *Review of Political Economy*: 1–24.

Zimmermann, Karin. 2012. Bericht zur Evaluation des „Professorinnenprogramm des Bundes und der Länder". Accessed 17 November 2020. https://www.hof.uni-halle.de/dateien/ab_6_2012.pdf.

9. Appendix

Appendix IV-A: Variable list

Variable	Description
Age Doctorate^{+}	The age of the professor when he or she earns her PhD.
Age First Professorship^{+}	The age of the professor when he or she obtains tenure.
Age in 2018^{+}	The age of the professors in 2018.
Equality Ranking	The level of gender equality of the appointing university measured by the rank in the bi-annual reports "Hochschulranking nach Gleichstellungsaspekten" (University Ranking According to Equality Aspects) issued by GESIS – Leibniz Institut für Sozialwissenschaften Kompetenzzentrum Frauen in Wissenschaft und Forschung (CEWS) from 2003.
Federal State	The federal state in which the university is located where a professor obtained his or her first tenured professorship.
Female	A binary variable that equals one, if a professor is female.
Field	The field of business administration, in which a professor works in (Accounting, Business Information Systems, Finance, Management, Marketing, Operations, and Other).
JQL3 Score	The publication record of a professor measured by the *JQL3*, either with an one-year lead or not.
Linear Time Trend	A linear time trend that reflects the year in which a professor obtained his or her first tenured professorship.
Number of Different Coauthors	The number of different coauthors of a professor until he or she receives tenure with an one-year lead.
Number of Publications	The number of publications of a professor until he or she receives tenure with an one-year lead.
Post (Round 1)	A binary variable that equals one, if a professor obtains tenure during the first round of the WPP (2008-2012).
Post (Round 2)	A binary variable that equals one, if a professor obtains tenure during the second round of the WPP (2013-2017).
SNIP Score	The publication record of a professor measured by the *SNIP* with an one-year lead.
Time to Tenure^{+}	The difference (in years) between the years in which a professor earns his or her PhD and obtains tenure.
Treated (Combined Rounds)	A binary variable that equals one, if a professor obtains tenure at a university that participates in either round of the WPP.
Treated (Round 1)	A binary variable that equals one, if a professor obtains tenure at a university that participates in the first round of the WPP.
Treated (Round 2)	A binary variable that equals one, if a professor obtains tenure at a university that participates in the second round of the WPP.
University Reputation	The reputation of the appointing university measured by the average *Handelsblatt* BWL rankings 2010, 2012, 2014, and 2018. We sort the universities in our sample into four groups: First, the top 10% universities according to this measure. Second, the top 25% (but not top 10%) universities. Third, the top 50% (but not top 25%) universities. Fourth, the bottom 50% of the universities.
Year	The year in which a professor obtains his or her first tenured professorship.

$^{+}$ indicates that we partially use imputed variables.

V. How do researchers react to changing incentives? Causal evidence from a journal ranking update

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How do researchers react to changing incentives? Causal evidence from a journal ranking update

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Abstract – This study provides causal evidence on how researchers respond to changing incentives. To causally identify researchers' behavioral response to changing incentives, we exploit a quasi-natural experiment and analyze the effects of an update of a survey-based journal ranking on affected researchers' choice of publication outlets, using a difference-in-differences approach. Specifically, we undertake two studies. In study 1, we analyze a self-collected panel data set containing publications in journals whose rank improved in the ranking update ('treated journals') and journals whose rank remain constant ('untreated journals') to thus measure the effect of a journal upgrade on the representation of researchers in treated vs. untreated journals. We find that affected researchers, i.e., those for whom the ranking is relevant, increasingly choose the upgraded journals as their publication outlets – both, compared to journals whose rank does not change, and also compared to unaffected researchers, i.e., to researchers for whom the ranking is not relevant. Exploring potential heterogeneities, we further find the behavioral response to the ranking update to differ across journal ranks and researchers. To investigate the latter, we collect a second, person-centered, data set containing the publication profiles of affected researchers (study 2) and find affected researchers' behavioral response to be more pronounced for the younger researchers and for those who have stronger publication records.

Keywords: difference-in-differences, incentives, journal rankings, publication strategy

JEL-Codes: A14, I23, J45

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1. Introduction

Using journal rankings to assess the quality of research has become increasingly popular (Aguinis et al. 2020). Journal rankings are used for a variety of quality assessment purposes, e.g. to objectify the decisions of faculty committees and hiring & promotion panels and/or to steer the allocation of resources within and between research institutions (see, e.g., Rafols et al. (2012); Drivas and Kremmydas (2020)). As a result, publications in peer-reviewed journals have become "the currency" of performance for the evaluation of researchers, departments, faculties and universities (Osterloh and Frey 2020) and can thus be expected to affect researchers' publication behavior.

The adequacy of journal rankings to assess the quality of the research published therein is subject to considerable debate (see, e.g., Mingers and Willmott (2013), Osterloh and Frey (2020)) in which especially the increasing pressure to publish in top tier journals has gained recent interest (e.g., Aguinis et al. (2020); Heckman and Moktan (2020); Salandra et al. (2022)). Critics fault the "fetishism" of journal rankings (Willmott 2011), and their "seductive power" (Nkomo 2009) bearing the potential to narrow researchers' choice of topics, theories and methods, to foster questionable research practices (Aguinis et al. 2020) and to suppress interdisciplinary research (Rafols et al. 2012).

Our knowledge on whether and how journal rankings affect researchers' publication behavior is, however, limited – in spite of the growing literature in the field. While Salandra et al. (2022) contribute to filling this void by asking researchers how many citations they would be willing to (hypothetically) forego to be able to publish their work in a higher ranked journal, we aim to quantitatively assess the effect of a change in a journal ranking on researchers' *actual* publication behavior. We do so by exploiting a quasi-natural experiment in a difference-in-differences approach, comparable to the recent study by Drivas and Kremmydas (2020) who study the causal effect of a change in a journal ranking on researchers' *citation* behavior.

In our paper, we add to the literature on the effects of journal rankings on researchers' publication behavior by exploiting a quasi-natural experiment that allows us to causally

identify how researchers respond to an update of a journal ranking that changes their incentives to publish in one publication outlet versus another. Specifically, we use a difference-in-differences approach to analyze how the update of a prominent survey-based journal ranking changes researchers' publication behavior such that they publish more in journals whose rank improves (i.e., who experienced an upgrade) versus journals whose rank remains constant. This causal identification is crucial because it allows for an unbiased assessment of researchers' behavioral response to a journal ranking update – which then delivers the basis on which to derive well-grounded implications for policy makers and leaders of research institutions.

Starting point of our analysis is the conjecture that, in general, researchers strive to publish their work in highly ranked scientific journals (see, e.g., Salandra et al. (2022)). They may do so to increase the likelihood that their work is well-received and recognized (Drivas and Kremmydas 2020), but in addition they will also profit from a whole set of tangible and intangible benefits which are tied to publishing in highly ranked journals: e.g., they might receive direct monetary payments (Osterloh and Frey 2020), their career chances will be enhanced (Bajo et al. 2020; Heckman and Moktan 2020) and their reputation and prestige will as well (Roach and Sauermann 2010; Sauermann and Stephan 2013; Stern 2004).

While publishing in more highly ranked journals will in general be associated with considerably higher cost in terms of time and effort, our setting allows us to identify a situation where the benefits of publishing in a given journal increase – without the costs of publishing in the respective journal increasing *at the same time*. More specifically, we refer to the update of a prominent journal ranking where some journals are upgraded while others are not. We argue that this upgrade increases the benefits of publishing in the respective journals – irrespective of whether the upgrade is warranted or not: If a journal upgrade is warranted, the new rank now better reflects the costs of publishing in the upgraded journal that might have risen long before. If the upgrade is not warranted, the costs of publishing in the upgraded journal will most certainly also increase in the process (thus rendering the upgrade a self-fulfilling prophecy), but they will only do so subsequently.

Hence, and as a result of the temporal divergence of changes in the benefits and costs of publishing in a given journal, the incentives to publish in an upgraded journal will *increase* following the update of the ranking – no matter whether the upgrade is initially warranted or not.

While the first part of our identifying assumption refers to journal upgrades increasing the benefits of publishing in the respective journals without affecting the costs of publishing in the respective journals at the same time, the second part of our identifying assumption concerns the fact that the ranking update is only relevant for a particular group of researchers. As a result, the benefits of publishing in a given journal only increase for this one group of researchers, while leaving other researchers unaffected. It is in this specific setting that we can causally identify the effect of a change in incentives by testing whether the affected researchers differ in their response to the change in incentives from the unaffected ones.

Our findings confirm our theoretical predictions: Following the upgrade of a specific journal, affected researchers increasingly choose the respective journal as their publication outlet – both, compared to journals whose rank did not change and compared to unaffected researchers. Exploring potential heterogeneities at the level of journal ranks (e.g., whether a journal is upgraded from second to first or from third to second tier), we find our results to be mainly driven by journals that are upgraded from third tier to second tier, but not by journals that are upgraded from second to first or fourth to third tier.

Additionally exploring potential heterogeneities at the level of researchers, we undertake a second study and find affected researchers' behavioral response to the ranking update to be more pronounced for the younger researchers and for those with stronger publication records. Both of these results render further support to our theoretical argumentation: For the younger researchers, the benefits of publishing in highly ranked journals are arguably larger, and for researchers with stronger publication records, the (individual) costs to switch between production outlets and flexibly adapt to different publication standards will most likely be lower.

Our work adds to the literature on behavioral responses to incentives in general (Balasubramanian et al. 2017; Lazear 2018; Lee and Meyer-Doyle 2017) and in academia in particular (e.g. Blomfield and Vakili (2022), Myers (2020), Ong et al. (2018), Squazzoni et al. (2013), or Zhang et al. (2019)). More specifically, we contribute to recent work that analyzes the effect of journal rankings on researchers' publication strategy: Buehling (2021) finds the introduction of a new journal ranking to affect researchers' choice of topic. Śpiewanowski and Talavera (2021) study researchers' response to the update of a (different) journal ranking and find researchers to publish less in journals that were downgraded. We add to this literature, (a) by being the first to use a difference-in-differences estimation to *causally identify* the effects of changing incentives to publish in one journal or the other, and (b) by additionally *exploring potential heterogeneities* with respect to journal ranks and researcher characteristics.

Concluding, our study offers two major contributions. *First*, we causally identify the effects of a change in the incentives to publish in one journal versus another on the publication strategy of affected as opposed to unaffected researchers. As a result, we provide an unbiased assessment of researchers' behavioral response to changing incentives. *Second*, we investigate into potential heterogeneities concerning the behavioral response of researchers to a change in the incentives to publish in one journal versus another: both, with respect to journal ranks and with respect to researcher characteristics. By exploring heterogeneities among researchers, we follow the recent call by Śpiewanowski and Talavera (2021) who conjecture that the "impact of … ranking change is … unlikely to be homogenous" and that future work should investigate into this.

Our study does have important implications for policy makers and university leaders: Researchers react to incentives, and journal rankings do have an impact on researchers' publication strategies. This is not a minor point because it basically tells us that researchers, even if they are regularly attributed a "special" and more intrinsic motivation (Lounsbury et al. 2012; Stern 2004), are ultimately no different from other economic actors in that they respond to incentives in a predictable way. This, however, places a great responsibility on policy makers and university leaders: It *does* matter what they do in terms of incentivizing

(or not incentivizing) researchers. If even small changes in a journal ranking have sizeable effects on the publication behavior of researchers, then this should be taken as an indication that such rankings, contrary to what is often postulated, are by no means neutral or "innocent", but that they actually guide researchers' behavior.

Our paper proceeds as follows. In Section 2, we provide our theory and context. More specifically, we elaborate on the link between the update of a journal ranking and affected researchers' incentives to publish in journals that experience an upgrade as compared to journals whose ranking does not change. Further, we introduce our setting and identifying assumptions and derive our specific hypotheses. In Section 3, we present our first study that investigates the causal effect of the ranking update on the representation of affected researchers in upgraded journals. Section 4 covers our second study, which explores potential heterogeneities in terms of the researchers' age and publication records. In Section 5, we provide a discussion regarding the results of both our studies.

2. Theory and Context

2.1 Ranking Upgrades and Publication Incentives

Researchers compete for limited publication space in academic journals, particularly in the highly ranked ones. Highly ranked journals are, on average, more visible, and they are cited more heavily, thus enhancing researchers' chances that their work is noticed and well received and can thus have an impact on the work of others. As Drivas and Kremmydas (2020) have shown, papers published in journals that received a ranking upgrade are cited more frequently after the ranking upgrade as compared to papers published in journals that received a downgrade.

Next to researchers' (intrinsic) motivation to be better able to advance science, there are several tangible and intangible benefits tied to publishing in highly ranked academic journals. While the intangible benefits of publishing in highly ranked journals refer to an enhanced reputation and prestige (Roach and Sauermann 2010; Sauermann and Stephan

2013; Stern 2004), tangible benefits might take different forms: First, researchers might receive a direct monetary compensation for having published in a highly ranked academic journal from their university or research institution (Osterloh and Frey 2020). Second, having published in a highly ranked journal may positively affect a researcher's academic career, in terms of, e.g., receiving job offers from more highly reputed and potentially also better paying institutions, or – most prominently – in terms of being tenured (Bajo et al. 2020; Heckman and Moktan 2020). Lastly, publications in highly ranked journals may also positively affect researchers' career options outside academia, e.g., their chances of being offered a position in a highly reputed advisory board or expert committee. As a result, researchers will, ceteris paribus, have an incentive to publish in highly ranked journals as opposed to lower ranked ones.

However, publishing in highly ranked journals is also associated with a considerable higher cost in terms of time and effort. To publish their work in a highly ranked journal, researchers have to make sure, e.g., that their research provides a substantial, and not only minor, contribution to the field, that their identification strategy is "squeaky clean", that they advance and enrich theory rather than only apply it to a different context, that their empirical design is well-thought-out and innovative, or any combination of the above. Also, the review processes in highly ranked journals will most likely be more tedious with, e.g., higher bars to even enter the review process, more reviewers being assigned to a submission, a higher probability of rejection following the reviews, more substantial revisions being asked for, and more revision rounds to be completed before a manuscript is finally accepted for publication.

When deciding on whether to publish in a given journal, researchers will weigh the benefits and costs of doing so. If the benefits to publish in a given journal increase, researchers are *ceteris paribus* more likely to choose the respective journal as their publication outlet.

While, in general, we might expect a change in the rank of a given journal to be mirrored in both, the benefits of publishing in that very journal *and* the costs of publishing there, the two will not necessarily be affected *at the same time*, but often rather subsequently.

If, for instance, a journal faces a re-launch with a more ambitious and demanding editorial board, the costs of publishing in that journal will – more or less instantaneously – increase for any new submission, while it will take some time until the benefits to publish in that journal will also increase. This is because there will be a pipeline of manuscripts that have been accepted for publication before the re-launch, such that it will take some time until the ranking of the journal will improve as well. As soon as the ranking does improve (and it should, once the increase in manuscript quality becomes visible and citation rates increase), the benefits of publishing in the respective journal will also increase – long after the increase in costs that took place at the re-launch. Such a warranted upgrade of a journal that "catches up" with an earlier increase in publication standards, will positively affect researchers' incentives to publish in the respective journal. Likewise, a warranted downgrade of a journal that reflects an earlier decrease in publication standards will negatively affect researchers' incentives to publish in the respective journal.

If, for whatever reason, the ranking of a journal improves without its publication standards having been raised before (i.e., the journal experiences an unwarranted upgrade), the benefits of publishing in that journal will increase and researchers' incentives to publish in the respective journal will increase as well, most likely inducing a subsequent increase in publication standards. The initially unwarranted upgrade of the journal will thus turn into a self-fulfilling prophecy (and the same would apply for an originally unwarranted downgrade of a journal).

Hence, no matter whether a change in a journal's ranking is warranted or not, we expect researchers' incentives to publish in a given journal to increase following the upgrade of a journal's rank.

However, we do not expect all researchers to react to a change in a journal's rank to the same degree. Specifically, we expect younger researchers to react more strongly to a change in a journal's rank because their individual benefits to publish in a more highly-ranked journal rather than in a lower-ranking one are higher as compared to older researchers. Typically, younger researchers are more likely to not yet have achieved their career goals (e.g., in terms of having received tenure or having arrived where they wanted

to be), and will thus profit comparatively more from a publication in a highly ranked journal. Similarly, we expect those researchers to react more strongly to changes in journal rankings who – already before the change in the ranking – have been more successful in publishing in highly ranked journals. This is because researchers that publish in highly ranked journals are more likely able to meet the higher publication standards that resulted in the journal upgrade (in case the upgrade catches up with an earlier lift in publication standards) or that were induced by an initially unwarranted journal upgrade.

2.2 Setting, Identification and Hypothesis

Journal rankings are by no means universal. For instance, in business research, our field of application, there is a multitude of journal rankings that have been issued by different players in the field (cf. Adler and Harzing (2009)). Among the different journal rankings, the ranking issued by the *German Academic Association for Business Research (VHB)* does have considerable relevance for business researchers located in Austria, Germany, and Switzerland (Eisend 2011). Tenure and appointment committees in the respective countries regularly use this ranking to comparatively assess researchers' publication portfolios, and business researchers in the respective countries often explicitly add a journal's *VHB-journal-rank* when listing their publications in their CVs. In addition, a prominent business newspaper in Germany, the *Wirtschaftswoche*, employs the *VHB-journal-ranking* to construct and publish a ranking of business researchers in the German-speaking countries. To the contrary, for business researchers outside Austria, Germany, and Switzerland, the *VHB-journal-ranking* is hardly relevant at all.

To study the effects of a journal upgrade, we undertake two studies both of which refer to the latest update in the *VHB-journal-ranking* that took place in the year 2015.[1]

[1] The quasi-natural experiment that we investigate in our paper concerns the update to the current journal ranking *VHB-Jourqual 3*, which replaced the former ranking *VHB-Jourqual 2* in 2015. Please note that we refer to this journal ranking as the *VHB-journal-ranking* in our paper.

In study 1, we use a self-collected data set to identify the causal effect of a change in the rank of a journal on researchers' incentives to publish in the respective journal. Specifically, we use a difference-in-differences approach to analyze how the representation of researchers from the German-speaking countries in journals that experience an upgrade changes compared to their representation in journals whose ranking does not change.

Because our treatment refers to the update of a journal ranking that only affects business researchers in Austria, Germany, and Switzerland and no others, we measure the representation of business researchers in Austria, Germany, and Switzerland in terms of their relative *shares* among the authors in a given journal at a given time and in terms of the relative *share* of manuscripts that were (co-)authored by them in a given journal at a given time. In so doing, we introduce an additional level of comparison in our estimations (besides comparing treated and untreated journals pre and post the ranking update): the comparison between affected versus unaffected researchers. This further level is included as our treatment effectively refers to a *combination* of journals and researchers. For the sake of clarity, we refer to the journals that experience an upgrade in the journal ranking update as being "treated" and to the researchers for whom the journal ranking and its update is relevant (i.e., business researchers in Austria, Germany, and Switzerland) as being "affected" by the update. Journals whose rank does not change in the update are referred to as "untreated"; business researchers outside Austria, Germany, and Switzerland are referred to as being "unaffected".

Having thus specified the setting in which our first study is situated, our specific hypotheses read as follows:

H1: Following the update of a journal ranking, the share of articles that are (co-)authored by affected researchers in upgraded journals will increase as compared to journals with a constant ranking.

H2: Following the update of a journal ranking, the share of affected authors in upgraded journals will increase as compared to journals with a constant ranking.

To next explore potential heterogeneities among affected researchers, we undertake a second study (study 2) that is based on a self-collected person data set containing information on the publication output of affected researchers – to thus deep-dive into potential heterogeneities across researchers with respect to researchers' age and publication records.

3. Study 1

In study 1, we test our two hypotheses by analyzing the causal effect of the update of the *VHB-journal-ranking* on the representation of affected researchers in upgraded journals (treatment group) as compared to journals with a constant ranking (control group).

3.1 Data and Methodology

3.1.1 Data

We begin our data collection by downloading publicly available files from the webpage of the VHB[2], which display the ranks of journals that were covered in the *VHB-journal-ranking* preceding and following the ranking update in 2015. The *VHB-journal-ranking* ranks journals into six categories: A+, A, B, C, D, and not ranked. We restrict ourselves to journals that have a ranking between A+ (outstanding, world-leading scientific business administration journals) and C (recognized scientific business administration journals) according to both versions of the ranking. This approach results in 424 journals. We remove two journals with inconclusive rankings according to the updated ranking as well as one journal that has been downgraded from A to B. This results in 421 journals.

[2] Please visit https://vhbonline.org/en/vhb4you/vhb-jourqual/vhb-jourqual-3/tables-for-download to retrieve the respective files.

We then scrape the online literature database Microsoft Academics[3] using an API client[4] to retrieve all papers published in these journals between 2010 and 2021 where information regarding the affiliations of all authors is available. As Microsoft Academics covers not all journals, we are able to retrieve data for 400 journals, which constitute our final sample. In particular, we retrieve data for 437,270 publications for which we have information regarding the journal in which the paper is published, the year in which the paper is published as well as information regarding the affiliations of all authors that contributed to the paper. In our final sample, we have five journals that have been upgraded from A to A+, 21 journals that have been upgraded from B to A, and 63 journals that have been upgraded from C to B. 311 journals retained their original ranking.

The next step is to assign all affiliations in our data to the respective countries in order to identify affected authors with respect to ranking upgrades. The authors in our data are affiliated with 12,376 unique affiliations. To assign these affiliations with the respective country, we scrape the Wikipedia webpages of the affiliations to assign the country of the affiliation. In cases where this procedure renders no results, we assign the country by hand. Given the country of the affiliations, we can identify authors who are subject to our treatment, i.e. who are "affected". Given our setting, we define affected authors as authors who are affiliated in one of the following three countries: Austria, Germany, or Switzerland.

Based on this data, we then create a panel data set where the level of observation are journal-years. Our final panel consists of 4,584 journal-year observations. For each journal-year, we calculate two variables that we use in our regression models as dependent variables. The first variable *(% Papers with at least one Affected Author)* is the fraction of papers with at least one affected author. To construct this variable, we count the number of papers in any journal-year where at least one of the authors is identified as "affected" and divide this by the total number of papers in the same journal-year. The average fraction of papers with at least one affected author equals 11.70% in our data.

[3] Please note that Microsoft Academics was retired at the end of 2021.

[4] To be precise, we use the r package "microdemic" as introduced by Chamberlain and Baker (2021).

The second variable *(% Affected Authors)* is the fraction of affected authors in any journal-year, which accounts for increasing coauthor teams over time (Jones 2021). To calculate this variable, we count the number of affected authors who published in a given journal-year and divide it by the number of all authors who published in the same journal-year. The average fraction of affected authors in our data is 8.98%.

3.1.2 Methodology

To test whether the representation of affected authors in upgraded journals increases more strongly compared to journals with a constant ranking following the ranking update, we estimate a difference-in-differences model of the following form:

$$y_{i,t} = \beta_1 * Post\ Update_t + \beta_2 * Upgraded\ Journal_i + \beta_3 * Post\ Update_t \times Upgraded\ Journal_i + \theta_i \quad \text{(V.I)}$$

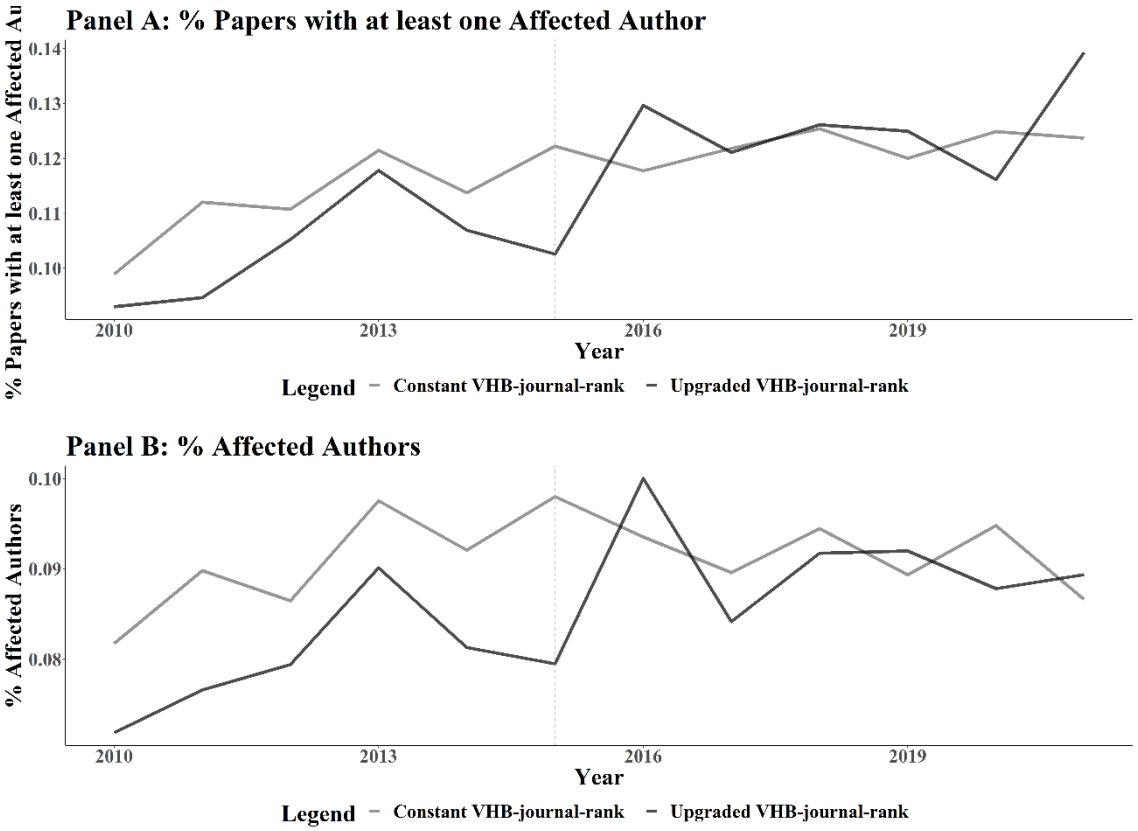
In this model, $y_{i,t}$ is one of the two dependent variables, i.e. the *% of Papers with at least one Affected Author* and the *% Affected Authors* in journal i in year t. The dummy $Post\ Update_t$ equals one for the years 2016 and later. Even though the ranking update was released at the beginning of 2015, we expect the effects of the ranking update should not be visible until a year later at the earliest, as the submission as well as the revise and resubmit process typically takes some time. $Upgraded\ Journal_i$ is a dummy variable that equals one, if a journal receives an upgrade in the update of the *VHB-journal-ranking*. We are particularly interested in the coefficient of the difference-in-differences estimator $Post\ Update_t$ *x* $Upgraded\ Journal_i$, which indicates whether affected authors did increase their representation in upgraded journals more strongly compared to journals with a constant ranking following the ranking update. In addition, we use journal fixed effects θ_i to control for any time-invariant journal characteristics, which absorb the coefficient of the dummy variable $Upgrade\ Journal_i$. We estimate our models using clustered standard errors at the journal-level.

3.2 Results

3.2.1 Main Result: The causal effect of journal upgrades

A crucial assumption for any difference-in-differences model is that the variables of interest follow parallel trends for the treatment and the control group prior to the treatment. In order to show that the parallel trends assumption holds in our study, we display the parallel trends graphically in Figure V-1.

Figure V-1: Parallel Trends – Main Effect



Notes: This figure displays parallel trends regarding both of our dependent variables. Panel A shows the fraction of papers with at least one affected author in journals with a constant *VHB-journal-rank* (grey line) respectively those journals with an upgraded *VHB-journal-rank* (black line) over time. Panel B shows the fraction of affected authors in journals with a constant *VHB-journal-rank* (grey line) respectively journals with an upgraded *VHB-journal-rank* (black line) over time.

Panel A of Figure V-1 shows parallel trends with regard to our first dependent variable, i.e. the fraction of papers with at least one affected author. The grey line displays the fraction of papers with at least one affected author in journals whose ranking does not

change. The black line displays the share of papers with at least one affected author in journals that receive an upgrade in 2015. Most importantly, we observe parallel trends prior to our treatment in 2015. Additionally, we find that the fraction of papers with at least one affected author is lower for upgraded journals prior to the treatment but increases to a similar level after the ranking update.

Panel B of Figure V-1 displays parallel trends concerning our second dependent variable, i.e. the fraction of affected authors. The grey line shows the fraction of affected authors in journals whose rankings did not change in 2015. The black line shows the fraction of affected authors in journals whose ranks are upgraded. Again, and most importantly, we observe parallel trends before the treatment. Furthermore, we also find that the fraction of affected authors in upgraded journals is lower than in journals with a constant ranking before 2015. After the ranking update, we find that the fraction of affected authors is similar in both groups.

Table V-1 displays regression results for our first study. Column (1) reports the result regarding the first dependent variable, i.e. the fraction of papers in a journal with at least one affected author (*% of Papers with at least one Affected Author)*. The coefficient of the interaction term is statistically significant and positive. This indicates that the fraction of papers with at least one affected author increases more strongly in journals that receive an upgrade of their rank compared to those journals whose rank remains constant. The magnitude of the coefficient equals 0.0129, which is economically meaningful, given that the average fraction of papers with at least one affected author equals 11.70%. Our finding supports our first hypothesis that affected researchers react to the upgrade of a journal's rank as they publish more frequently in upgraded journals (compared to journals with constant rankings) after the new version of the ranking has been released.[5]

[5] That we also find a significantly positive coefficient for the *Post Update* dummy indicates that the fraction of papers with at least one affected author also increases in journals with a constant ranking. This finding is in line with previous literature highlighting that business administration researchers in the German-speaking countries *in general* increasingly focus on journal publications in the respective time frame (as opposed to the publication of monographs or chapters in edited books, see, e.g., Ayaita et al. (2019)) – thus catching up with business researchers from other countries that had focused on journal publications long before.

Table V-1: Panel Regressions – Main Effect

All upgraded journals

	(1)	(2)
	% Papers with at least one Affected Author	% Affected Authors
Mean LHS	0.1170	0.0898
Post Update	0.0097**	0.0016
	(0.0048)	(0.0042)
Post Update x Upgraded Journal	0.0129*	0.0092*
	(0.0069)	(0.0055)
Journal Fixed Effects	Yes	Yes
Observations (journal-years)	4,584	4,584
R^2	0.0056	0.0013
F Statistic	11.8610***	2.6966*

Notes: This table reports the results of our main difference-in-differences estimation. *Post Update*$_t$ is a dummy variable that equals one, for the years 2016 and later. The difference-in-differences estimator is *Post Update*$_t$ *x Upgraded Journal*$_k$, which indicates whether affected authors did increase their representation in upgraded journals in consequence of the ranking update as compared to those journals with a constant ranking. In addition, we use journal fixed effects to control for any time-invariant journal characteristics which absorb the coefficient of the dummy variable *Upgraded Journal*$_k$. All models are estimated using journal-clustered standard errors. Significance levels are denoted as follows: *p<0.1; **p<0.05; ***p<0.01.

Column (2) shows our results regarding the second dependent variable, i.e. the fraction of affected authors in journals (*% Affected Authors)*. Again, we find that the coefficient of the interaction term is statistically significant and positive. This shows that the fraction of affected authors increases more strongly in upgraded journals following the ranking update when compared to journals with a constant rank. The size of the coefficient (0.0092) is again economically relevant, as the average fraction of affected authors in our sample equals 8.98%. This result supports our second hypothesis that the fraction of affected authors will increase more strongly in upgraded journals than in journals with constant ranks.

To further substantiate our main result, we undertake a robustness check and conduct a placebo test where we focus on business researchers affiliated to U.S. institutions instead of business researchers affiliated to institutions in German-speaking countries. Arguably, business researchers from the U.S. are not affected by the update of the *VHB-journal-ranking* (with the exception of those that might consider switching to an institution in a German speaking country in the future). As expected (see Appendix V-A for the details),

we find no reaction of U.S. affiliated authors to the ranking update in question. This placebo test supports our claim that the observed changes in the publication behavior of researchers from German-speaking countries can in fact be causally attributed to the change in incentives resulting from the update of the *VHB-journal-ranking*.

3.2.2 Supplementary results: Heterogeneities with respect to journal ranks

In what follows, we explore potential heterogeneities with respect to different journal ranks, i.e. we analyze if it makes a difference whether a journal is upgraded from, e.g., rank A to rank A+ or from rank B to rank A. In so doing, we extend the findings by Śpiewanowski and Talavera (2021) who present initial, yet no causal evidence, on researchers reacting differently to changes in journal ranks depending on the rank at which the change took place.

Panel A of Table V-2 shows the results of our difference-in-differences model, if we focus on journals that receive an upgrade from A to A+. We compare these journals to three different reference groups. First, we compare these journals to, both, journals that retain their original A and those that retain their original A+ rank (models (1) and (4)). Next, we compare these journals to both groups separately: journals that retain their A+ rank (models (2) and (5)) and journals that retain their A rank (models (3) and (6)). We find similar results for both our dependent variables: the share of papers with at least one affected author and the share of affected authors in a journal. The coefficients of the interaction terms are statistically insignificant in all six models, which indicates that affected researchers do not increase their representation in journals that receive an upgrade from A to A+ after 2015 – irrespective of the reference group.

Panel B of Table V-2 displays our results when comparing journals that receive an upgrade from B to A with journals that retain their original A and/or their original B rank. As opposed to the former analysis, we now find a significant increase in both our dependent variables for journals that were upgraded form B to A, if we compare them to journals

that retain their original A or B rank and if we compare them to journals that retain their original B rank. If we compare these journals to those that retain their original A rank, we find no significant increase following the ranking update for any of our dependent variables. This result shows that both, the share of papers with at least one affected author and the share of affected authors increase more strongly in journals that were upgraded from B to A as compared to constantly ranked A and B journals and that this effect is driven by the comparison to those journals that retain their original B ranking.

Panel C of Table V-2 presents the results of our analysis if we compare journals that receive an upgrade from B to C with journals that retain their original B and/or their original C ranking. We find no statistically significant interaction terms in models (1), (2), (4), and (5), which highlights that both, the share of papers with at least one affected author and the share of affected authors, do not increase more strongly in journals that were upgraded from C to B in comparison to constant B or C and in comparison to constantly ranked B journals. If we compare the journals that receive an upgrade from C to B to those journals that retain their original C ranking, however, we do find a statistically significant interaction term in both models (models (3) and (6)).[6]

[6] Please find additional robustness checks for these analyses in Appendix V-B. Again, we alter our dependent variables in such a way that we focus on U.S. authors instead of affected authors. Our results show that the interaction term of our difference-in-differences model is statistically insignificant in all models. This highlights that U.S. authors do not react to the upgrades in the journals ranking and that our results are not random.

Table V-2: Panel Regressions – Ranking Hetereogeneity

Panel A: VHB-journal-rank (A) to VHB-journal-rank (A+)

	% Papers with at least one Affected Author			% Affected Authors		
Mean LHS	0.1268	0.0651	0.1457	0.0884	0.0402	0.1036
Comparison group: Journals that retained their original … rank	(1) (A+)/(A)	(2) (A+)	(3) (A)	(4) (A+)/(A)	(5) (A+)	(6) (A)
Post Update	0.0355***	0.0215*	0.0408***	0.0191***	0.0086	0.0230***
	(0.0078)	(0.0099)	(0.0098)	(0.0057)	(0.0052)	(0.0075)
Post Update x Upgraded Journal	-0.0096	0.0043	-0.0149	-0.0027	0.0078	-0.0067
	(0.0190)	(0.0207)	(0.0199)	(0.0135)	(0.0133)	(0.0144)
Journal Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations (journal-years)	798	263	595	798	263	595
R^2	0.0050	0.0276	0.0635	0.0303	0.0296	0.0353
F Statistic	19.4471***	3.3911**	18.4079***	11.3961***	3.6465**	9.9440***

Panel B: VHB-journal-rank (B) to VHB-journal-rank (A)

	% Papers with at least one Affected Author			% Affected Authors		
Mean LHS	0.1378	0.1417	0.1319	0.1049	0.1012	0.1027
Comparison group: Journals that retained their original … rank	(1) (A)/(B)	(2) (A)	(3) (B)	(4) (A)/(B)	(5) (A)	(6) (B)
Post Update	0.0177***	0.0408***	0.0095	0.0072	0.0230***	0.0016
	(0.0067)	(0.0098)	(0.0082)	(0.0057)	(0.0075)	(0.0072)
Post Update x Upgraded Journal	0.0258**	0.0027	0.0340***	0.0165*	0.0006	0.0221**
	(0.0116)	(0.0136)	(0.0126)	(0.0094)	(0.0106)	(0.0104)
Journal Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations (journal-years)	2,299	785	1,764	2,299	785	1,764
R^2	0.0193	0.0726	0.0093	0.0043	0.0380	0.0029
F Statistic	14.8179***	28.0592***	7.5408***	4.5362**	14.1774***	2.3806*

Continued on next page

Table V-2 continued from previous page

Panel C: VHB-journal-rank (C) to VHB-journal-rank (B)

	% Papers with at least one Affected Author			% Affected Authors		
Mean LHS	0.1154	0.1314	0.1001	0.0910	0.1021	0.0792
Comparison group: Journals that retained their original … rank	(1) (B)/(C)	(2) (B)	(3) (C)	(4) (B)/(C)	(5) (B)	(6) (C)
Post Update	0.0028	0.0095	-0.0054	-0.0030	0.0016	-0.0086
	(0.0038)	(0.0082)	(0.0075)	(0.0051)	(0.0072)	(0.0071)
Post Update x Upgraded Journal	0.0125	0.0058	0.0208**	0.0092	0.0046	0.0148*
	(0.0083)	(0.0100)	(0.0094)	(0.0065)	(0.0083)	(0.0082)
Journal Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations (journal-years)	3,536	2,256	2,022	3,536	2,256	2,022
R^2	0.0015	0.0041	0.0031	0.0006	0.0006	0.0026
F Statistic	2.4226*	4.2637**	2.8342*	0.9316	0.6076	2.4080*

Notes: This table reports the results of our difference-in-differences estimations regarding different levels of journal rankings. Panel A compares journals that receive an upgrade from A to A+ with journals that retain their original A and/or A+ ranking. Panel B compares journals that receive an upgrade from B to A with journals that retain their original B and/or A ranking. Panel C compares journals that receive an upgrade from C to B with journals that retain their original C and/or B ranking. $Post\ Update_t$ is a dummy variable that equals one, for the years 2016 and later. The difference-in-differences estimator is $Post\ Update_t\ x\ Upgraded\ Journal_k$, which indicates whether affected authors did increase their representation in upgraded journals in consequence of the ranking update as compared to the respective control group. In addition, we use journal fixed effects to control for any time-invariant journal characteristics. All models are estimated using journal-clustered standard errors. Significance levels are denoted as follows: *p<0.1; **p<0.05; ***p<0.01.

Concluding, we find our main result to be driven by journals that are upgraded from second to third tier, but not by journals that are upgraded from second to first tier or journals that are upgraded from fourth to third tier. Also, our results show that our findings are mainly driven by the comparison of the upgraded journals to those journals that retain their initial (lower) ranking.

4. Study 2

In study 2, we explore potential heterogeneities in terms of the affected researchers' age and publication record and how these link to the magnitude of their reaction to the update of the *VHB-journal-ranking*.

4.1 Data and Variables

In this second study, we make use of a unique, hand-collected data set of business researchers in Austria, Germany, and Switzerland. We start by identifying all business researchers who hold a tenured professorship at a doctorate granting university in one of these three countries by the end of 2018 and identify 1,536 individual researchers. Next, we collect data (year and institution of each career step, year of birth, gender etc.) from the CVs of these researchers, if available on the internet. We omit researchers where information regarding their year of birth, the year of their first tenured professorship, and the university where they did obtain their PhD is missing. This constitutes our final sample of 1,124 researchers.

We get the information on the publications of the researchers in our data set from the online research-monitoring portal *Forschungsmonitoring* (cf. Ayaita et al. (2019), Bäker et al. (2021)). The publication data cover all journal publications written by the researchers in our data set and contain information regarding the year, journal and the number and names of the coauthors of every publication.

After having merged the publication data to our CV data, we calculate two variables that capture the reaction of the researchers in our data set to the journal upgrades. We use these two variables as the dependent variables in our regression models. We define the first dependent variable *# Pubs Upgraded* as the number of publications in upgraded journals published by a researcher in our data set between 2016 and 2018. In accordance with study 1, we define upgraded journals as those journals that are either upgraded from C to B, from B to A, or from A to A+. Table V-3 shows that the average value of

 # Pubs Upgraded equals 0.67, which indicates that researchers in our data publish an average of 0.67 publications in upgraded journals between 2016 and 2018. The second variable *Higher # Pubs Upgraded* is a dummy variable that equals one, if a researcher has more publications in upgraded journals between 2016 and 2018 (i.e. following the upgrade) compared to the period of 2013 and 2015 (i.e. preceding the upgrade). Table V-3 shows that the average value of *Higher # Pubs Upgraded* equals 0.23. This indicates that roughly 23% of the researchers in our sample publish more in upgraded journals in the first three years after the ranking update as compared to the three years before.

Based on our merged data set, we define a series of independent variables that we use to explore potential heterogeneities in terms of researchers' characteristics. First, we create a set of dummy variables to capture the *Age* of the researchers at the time of the ranking update in 2015 as we expect that younger researchers will react more strongly to the upgrades. In particular, we create three dummy variables that account for the age of the researchers in 2015. The first dummy variable equals one, if a researcher is younger than 40 in 2015 (22% of the researchers). The second dummy variable equals one, if a researcher is between 40 and 49 years in 2015 (41% of the researchers). The third dummy variable equals one, if a researcher is older than 50 years in 2015 (37% of the researchers). This third group of researchers constitutes the reference group in our regression models.

Table V-3: Variable Definitions and Summary Statistics Study 2

Dependent Variables

Variable Name	Variable Definition	Mean	SD	Obs.
# Pubs Upgraded	The number of publications in journals that have been upgraded during the update of the *VHB-journal-ranking* (C to B, B to A, and A to A+) published by a professor between 2016 and 2018.	0.6681	1.4228	1,124
Higher # Pubs Upgraded	Dummy variable that equals 1, if a researcher has more publications in journals that have been upgraded during the update of the *VHB-journal-ranking* (C to B, B to A, and A to A+) between 2016 and 2018 compared to the period from 2013 to 2015.	0.2340	0.4236	1,124

Independent Variables

Variable Name	Variable Definition	Mean	SD	Obs.
Age < 40	Dummy variable that equals 1, if a researcher's age is below 40 in 2015.	0.2189	0.4137	1,124
$40 \geq$Age < 50	Dummy variable that equals 1, if a researcher's age is between 40 and 49 in 2015.	0.4075	0.4916	1,124
Age ≥ 50	Dummy variable that equals 1, if a researcher's age is equal or above 50 in 2015.	0.3737	0.4840	1,124
Top 20% Publication Activity	Dummy variable that equals 1, if a researcher's publication activity prior to the update of the *VHB-journal-ranking* (measured by the yearly average number of publications) is above the 80% quantile.	0.1922	0.3942	1,124
Average 60% Publication Activity	Dummy variable that equals 1, if a researcher's publication activity prior to the update of the *VHB-journal-ranking* (measured by the yearly average number of publications) is between the 20% and the 80% quantile.	0.7117	0.4532	1,124
Bottom 20% Publication Activity	Dummy variable that equals 1, if a researcher's publication activity prior to the update of the *VHB-journal-ranking* (measured by the yearly average number of publications) is below the 20% quantile.	0.0961	0.2948	1,124
Top 20% Publication Performance	Dummy variable that equals 1, if a researcher's publication performance prior to the update of the *VHB-journal-ranking* (measured by a yearly average score based on the SJR: $SJR\ Score = \frac{1}{Years} \sum_{k=1}^{k=K} \frac{SJR_k}{Coauthors_k}$) is above the 80% quantile.	0.2002	0.4003	1,124

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Table V-3 continued from previous page

Independent Variables

Variable Name	Variable Definition	Mean	SD	Obs.
Average 60% Publication Performance	Dummy variable that equals 1, if a researcher's publication performance prior to the update of the *VHB-journal-ranking* (measured by a yearly average score based on the SJR: $SJR\ Score = \frac{1}{Years}\sum_{k=1}^{k=K}\frac{SJR_k}{Coauthors_k}$) is between the 20% and the 80% quantile.	0.5996	0.4902	1,124
Bottom 20% Publication Performance	Dummy variable that equals 1, if a researcher's publication performance prior to the update of the *VHB-journal-ranking* (measured by a yearly average score based on the SJR: $SJR\ Score = \frac{1}{Years}\sum_{k=1}^{k=K}\frac{SJR_k}{Coauthors_k}$) is below the 20% quantile.	0.2002	0.4003	1,124
Accounting	Dummy variable that equals 1, if a researcher operates in the field of Accounting.	0.1868	0.3900	1,124
Business Information Systems	Dummy variable that equals 1, if a researcher operates in the field of Business Information Systems.	0.0792	0.2701	1,124
Other Fields	Dummy variable that equals 1, if a researcher operates in one of the other fields of business administration, i.e. Finance, Management, Marketing, Operations, or Other.	0.7340	0.4420	1,124
Female	Dummy variable that equals 1, if a researcher's gender is female.	0.1824	0.3863	1,124
PhD German-speaking country	Dummy variable that equals 1, if a researcher obtained his or her PhD in one of the German-speaking countries.	0.9279	0.2587	1,124

Notes: This table reports definitions as well as summary statistics regarding the variables used in Study 2.

Next, we expect that researchers who are more active with respect to publishing in journals will react more strongly to the ranking upgrades. Thus, we create two variables that proxy the publication output of researchers prior to the ranking update. First, we consider the *Publication Activity* as measured by the average yearly number of publications a researcher has published until 2015. According to this measure of publication activity, we split researchers in our data into three groups. The first group contains researchers whose publication activity is above the 80% quantile. The second group contains researchers whose publication activity is between the 20% and the 80% quantile and constitutes the reference group in our regression models. The third group contains researchers whose publication activity is below the 20% quantile. The second variable, which we use as a proxy for the publication output of the researchers, is the variable *Publication Performance*. This measure accounts for coauthors and the quality of the publications as measured by the *SJR*.[7] Generally, a higher value indicates that a researcher publishes more and/or in more highly ranked journals. Again, we split the researchers in our data into three groups based on the quantiles of their publication performance.

Lastly, we include a set of control variables in our regression models. These variables have been shown to impact publication behavior in various ways. First, we control for the field of business administration in which the researchers operate. In particular, we create a dummy variable that equals one, if a researcher belongs to the field of accounting as well as a dummy variable that equals one, if a researcher belongs to the field of business information systems. Researchers in the remaining fields constitute the reference group in our regression models. We include dummies for the two fields as previous literature indicates that researchers from these two fields might be (dis-)advantaged when it comes to publishing their work in international journals compared to other fields in business administration (Grossmann et al. 2019; Korkeamäki et al. 2018; Templeton and Lewis 2015; Valacich et al. 2006). Second, we control for the gender of the researchers. More precisely,

[7] Please find the exact definition of our publication productivity variable in Table V-3. More information regarding the *SJR* weighting of *Forschungsmonitoring* can be found here: https://www.forschungsmonitoring.org/.

we include a dummy variable that equals one, if a researcher in our data is a woman. We include this variable to account for gender differences regarding researchers' publication output (Jokinen and Pehkonen 2017; Madison and Fahlman 2021). Finally, we control for the country in which a researcher obtained his or her PhD as, arguably, the update of the *VHB-journal-ranking* is more relevant for researchers who have been educated and socialized in the German-speaking university system. To account for this, we include a dummy variable that equals one, if a researcher obtained his or her PhD in one of the three countries under consideration.

4.2 Results

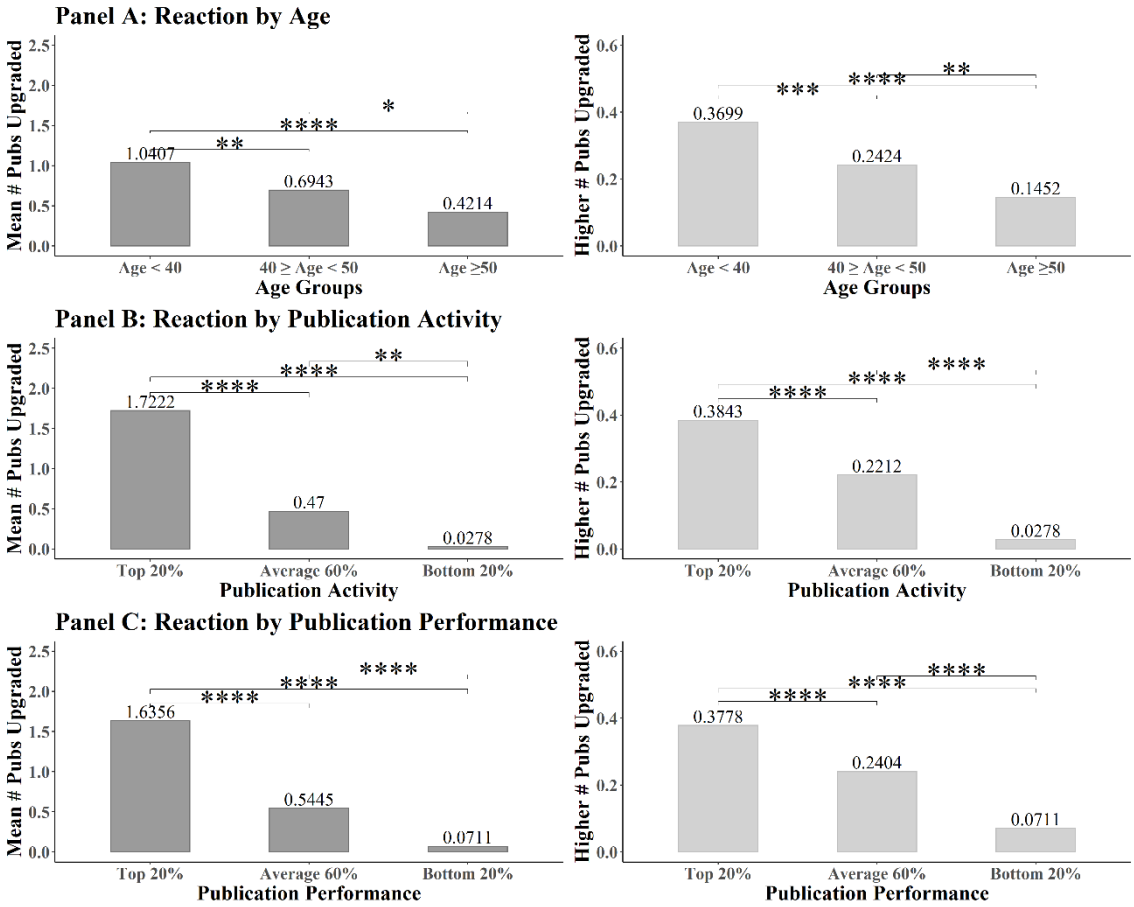
4.2.1 Univariate evidence

We start by graphically illustrating the links between researchers' characteristics in terms of age and publication output groups on the one hand and their publication behavior in upgraded journals on the other, testing for between-group differences via a series of Bonferroni-adjusted t-tests.

The left-hand side of Panel A of Figure V-2 shows that researchers in the youngest age group (Age <40) have the highest average number of publications in upgraded journals between 2016 and 2018 (1.04) when compared to the other age groups. Researchers in the medium age group (40 ≤Age < 50) publish 0.69 publications in upgraded journals between 2016 and 2018, and researchers who are older than 50 at the time of the update publish only 0.42 publications in upgraded journals between 2016 and 2018. All pairwise differences between the age groups are statistically significant. The right-hand side of Panel A documents our findings with regard to our second dependent variable, which measures whether researchers publish more in upgraded journals in the first three years after the ranking update compared to the three years before. We find that 37% of the youngest age group of researchers in our sample publish more in upgraded journals than they did before the update, compared to 24% of the medium-aged researchers and 15% of the oldest age

group in our sample. Again, all pairwise differences are statistically different from one another.

Figure V-2: Reaction to the *VHB-journal-ranking* Update by Researcher Characteristics



Notes: This figure displays average values of our two dependent variables according to the researcher characteristics. Panel A shows average values concerning our dependent variables if we split our data according to the *Age* of the researchers in 2015. Panel B shows the average values concerning our dependent variables if we split our data according to the *Publication Activity* of the researchers prior to the ranking update. Panel C shows the average values concerning our dependent variables if we split our data according to the *Publication Performance* of the researchers prior to the ranking update. Furthermore, we display the results of a series of Bonferroni-adjusted t-tests in order to test whether the average values of the groups differ significantly from each other. Significance levels are denoted as follows: *p<0.1; **p<0.05; ***p<0.01.

Panel B of Figure V-2 presents the average values of our dependent variables for different groups of researchers with respect to their prior, i.e. pre-update, publication activity. The left-hand side of Panel B shows that researchers with the highest publication activity (Top 20%) prior to the ranking update have the highest average number of

publications in upgraded journals afterwards (1.72). In contrast, researchers with a medium (0.47) respectively low publication activity (0.03) prior to the ranking update publish much less in upgraded journals between 2016 and 2018. Again, we find that all pairwise differences are statistically significant. The right-hand side of Panel B documents similar results with respect to our second dependent variable. 38% of the researchers with the highest publication activity publish more in upgraded journals than before the update, while only 22% of researchers with a medium and 3% of the researchers with a low level of publication activity do so. Again, all pairwise differences are statistically different from one another.

Finally, Panel C of Figure V-2 shows the univariate comparisons if we split the researchers in groups according to their prior publication performance where publication performance does not only refer to the number of journal publications but also to the quality of the respective journals as assessed by their *SJR* value. The left-hand side of Panel C documents that researchers with the highest level of publication performance publish the most in upgraded journals after the ranking update (1.64 publications on average). This is significantly more than researchers with a medium (0.54) or low publication performance (0.07). The same holds true for our second dependent variable. We find that 38% of researchers with the highest level of publication performance publish in more in upgraded journals than they did before, whereas only 24% of researchers with a medium level of publication performance and only 7% of researchers with a low publication performance do so.

4.2.2 Regression results

In a next step, we estimate a series of OLS regressions, controlling for a set of variables that have been found to affect publication behavior. Table V-4 presents our results.

Table V-4: OLS Regressions – Researcher Heterogeneity

	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) OLS	(6) OLS	(7) OLS	(8) OLS
	# Pubs Upgraded	Higher # Pubs Upgraded	# Pubs Upgraded	Higher # Pubs Upgraded	# Pubs Upgraded	Higher # Pubs Upgraded	# Pubs Upgraded	Higher # Pubs Upgraded
Mean LHS	0.6681	0.2340	0.6681	0.2340	0.6681	0.2340	0.6681	0.2340
Age < 40	0.6617***	0.2285***	0.6131***	0.2065***	0.3738***	0.1711***	0.4699***	0.1831***
	(0.1258)	(0.0357)	(0.1209)	(0.0361)	(0.1239)	(0.0372)	(0.1200)	(0.0370)
40 ≥Age < 50	0.2758***	0.0982***	0.2109**	0.0796***	0.0798	0.0576**	0.1203	0.0629**
	(0.0893)	(0.0265)	(0.0844)	(0.0260)	(0.0874)	(0.0266)	(0.0846)	(0.0264)
Top 20% Publication Activity			1.2588***	0.1654***			0.9906***	0.1281***
			(0.1661)	(0.0359)			(0.1539)	(0.0375)
Bottom 20% Publication Activity			-0.3072***	-0.1481***			-0.0453	-0.0365
			(0.0459)	(0.0221)			(0.0407)	(0.0316)
Top 20% Publication Performance					1.0786***	0.1227***	0.7377***	0.0785**
					(0.1673)	(0.0376)	(0.1481)	(0.0382)
Bottom 20% Publication Performance					-0.4146***	-0.1615***	-0.2141***	-0.1173***
					(0.0446)	(0.0226)	(0.0536)	(0.0333)
Accounting	-0.2626***	-0.0195	-0.2114***	-0.0097	-0.0568	0.0115	-0.0918	0.0067
	(0.0744)	(0.0310)	(0.0753)	(0.0311)	(0.0701)	(0.0311)	(0.0726)	(0.0313)
Business Information Systems	0.4175*	0.0962*	0.2059	0.0703	0.5136***	0.1057**	0.3142*	0.0806*
	(0.2214)	(0.0506)	(0.1945)	(0.0481)	(0.1993)	(0.0485)	(0.1867)	(0.0480)
Female	-0.1665*	-0.0034	-0.0824	0.0113	-0.0736	0.0091	-0.0446	0.0136
	(0.1009)	(0.0338)	(0.0919)	(0.0331)	(0.0964)	(0.0335)	(0.0903)	(0.0331)
PhD German-speaking country	-0.2035	0.0039	-0.3547	-0.0200	0.0589	0.0348	-0.1362	0.0082
	(0.2428)	(0.0490)	(0.2265)	(0.0472)	(0.2300)	(0.0500)	(0.2245)	(0.0495)

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Table V-4 continued from previous page

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	0.6461**	0.1370***	0.6030***	0.1516***	0.3397	0.1306**	0.3483	0.1330**
	(0.2534)	(0.0505)	(0.2290)	(0.0491)	(0.2391)	(0.0539)	(0.2259)	(0.0526)
p-value for test: $Age < 40 = 40 \geq Age < 50$	0.0028***	0.0005***	0.0009***	0.0006***	0.0173**	0.0023***	0.0033***	0.0012***
Observations	1,124	1,124	1,124	1,124	1,124	1,124	1,124	1,124
R^2	0.0435	0.0435	0.1728	0.0817	0.1458	0.0788	0.2079	0.0908
F Statistic	8.4765***	8.4761***	29.1199***	12.4061***	23.7847***	11.9269***	29.2079***	11.1173***

Notes: This table reports the results of eight different OLS regressions. Variable definitions can be found in Table V-3. All models are estimated using heteroscedasticity-robust standard errors. Significance levels are denoted as follows: *p<0.1; **p<0.05; ***p<0.01.

Model (1) shows that younger researchers publish more in upgraded journals after the ranking update in comparison to more senior researchers. More precisely, we find that researchers who are younger than 40 in 2015 at the time of the update publish significantly more (0.66) in upgraded journals compared to researchers who are older than 50 at the time of the update. The same holds true for researchers whose age is between 40 and 49 at the time of the update, as they also publish significantly more (0.28) than those who are 50 years or older. Both differences are not only statistically significant but also economically meaningful, as the average value of the number of publications in upgraded journals between 2016 and 2018 equals 0.67. Additionally, we conduct a Wald F-Test that shows that the coefficients of $Age < 40$ and $40 \geq Age < 50$ are significantly different from each other as well (p = 0.0028).

Model (2) documents a similar result for our second dependent variable, i.e. the dummy variable that indicates whether a researcher publishes more in upgraded journals after the ranking update as compared to before. In particular, we find that researchers who are younger than 40 at the time of the update publish more in upgraded journals (0.23) compared to their peers who are 50 years or older. The same holds true if we compare researchers in the medium-age range to those who are 50 years or older at the time of the update. The difference (0.10) is statistically significant again. Again, we consider both differences economically relevant, given that the average of the dependent variable equals 0.23 in our sample. In addition, a Wald F-Test indicates that the coefficients of the two younger age groups are again significantly different from one other (p = 0.0005). In summary, our results in Models (1) and (2) highlight that younger researchers react more strongly to the ranking upgrades as compared to more senior researchers.

Model (3) focuses on different groups of researchers with respect to their publication activity prior to the ranking update. We find that the group of researchers who are most active before the update publishes significantly more (1.26) in upgraded journals between 2016 and 2018 in comparison to researchers with a medium level of publication activity prior to the update. In contrast, researchers from the least publication active group prior to the update publish significantly less (-0.31) in upgraded journals compared to their peers

with a medium level of publication activity prior to the update. Both differences are not only statistically significant but also economically meaningful as the average number of publications in upgraded journals between 2016 and 2018 in our sample is 0.67.

Model (4) again focuses on different groups of researchers with respect to their publication activity prior to the ranking update, now with respect to our second dependent variable that measures whether researchers publish more in upgraded journals after the ranking update than they did before. We find that researchers who are most active in publishing before the update publish more often in upgraded journals (0.17) compared to researchers with a medium level of publication activity. Additionally, researchers who are least active in terms of publication publish less often in upgraded journals (-0.15). Again, both differences are also economically meaningful, as the mean of the dependent variable in our sample equals 0.23. The findings in Models (3) and (4) are in line with our expectation that researchers who are more active with respect to publishing their work in academic journals react more strongly to the ranking upgrades.

In Models (5) and (6), we substitute our measure for publication activity with our coauthor- and quality-adjusted measure for publication performance. Column (5) presents evidence that researchers with the highest level of publication performance publish significantly more in upgraded journals (1.08) after the ranking update as their peers with a medium level of publication performance. In addition, we find that researchers with the lowest levels of publication performance publish significantly less in upgraded journals (-0.41) after the update than researchers with medium levels of publication performance. Again, the differences are not only statistically significant but also economically meaningful.

Model (6) shows that researchers with the highest level of publication performance publish more in upgraded journals (0.12) when compared to researchers with medium levels of publication performance. In contrast, researchers with the lowest levels of publication performance publish less in upgraded journals (-0.16) in comparison to their peers with medium levels of publication performance. The differences are again economically meaningful. Overall, the results from Models (5) and (6) are further evidence in support of

our expectation that researchers with higher levels of publication output react more strongly to the ranking upgrades.

In the last two Models of Table V-4 (Models (7) and (8)), we include all variables in the same regression. These models corroborate the above presented evidence. With regard to our control variables, we barely find persistent patterns. However, it appears as if accounting scholars react less strongly to the ranking upgrades compared to their peers in other business administration fields. In contrast, business information systems researchers appear to react more strongly to the ranking upgrades.[8]

Overall, our analyses show that researchers do not react homogeneously to upgrades in a journal ranking, and we are able to quantify these heterogeneous effects – thus responding to the recent call by Śpiewanowski and Talavera (2021). To the best of our knowledge, this has not been accomplished before. Moreover, our results on heterogeneities with respect to researchers' age and publication records lend further support to our theoretical argumentation: For the younger researchers whom we find to more strongly react to the update, the benefits of publishing in highly ranked journals are arguably larger, and for researchers with stronger publication records whom we also find to more strongly react to the update, the (individual) costs to switch between production outlets will most likely be lower.

5. Discussion and Conclusion

Summary of Results

Based on two unique data sets, our paper conducts two studies that provide novel evidence regarding how researchers respond to changing incentives to publish in certain journals as opposed to others. More specifically, we analyze how the update of a specific

[8] To provide evidence concerning the robustness of our results, we estimate a series of additional regression models in Appendix V-C. More precisely, we replace the OLS regression models with Tobit respectively Logit regressions. To account for the fact that our first dependent variable *# Pubs Upgraded* is censored to the left we estimate Tobit regressions as a robustness check. Our second dependent variable *Reaction to Upgrades*, is a binary variable. Hence, we estimate Logit regressions to show that our results are robust to the choice of our model.

journal ranking causally affects the publication behavior of researchers for whom the journal ranking is relevant. As theoretically predicted, we find affected researchers to increasingly publish in journals that are upgraded – both compared to journals that retain their original ranking and compared to researchers that are not affected because for them the ranking and its update are not relevant. Second, this effect is heterogeneous across journal ranks. Researchers mainly respond to ranking upgrades from third-tier to second-tier journals. Third, we find that younger researchers react more strongly to the ranking upgrades as compared to their more senior peers. Fourth, researchers with higher levels of (quality adjusted) publication output prior to the update react more strongly to the ranking upgrade in comparison to their peers with lower levels of (quality adjusted) publication output.

Limitations

Our paper is, of course, not without limitations. As the ranking we focus on in our paper is survey-based, the update we observe in our study is not completely "exogenous", but rather affected by the voting behavior of the researchers for whom the ranking is relevant. While, from the perspective of an individual researcher, the update might still be regarded exogenous, collusive voting behavior among groups of individual researchers cannot be fully ruled out. For instance, researchers might place their votes strategically and arrange for journals to be upgraded that should not be upgraded objectively. However, a graphical inspection of the *SJR* values of journals that were upgraded compared to journals that retained their original ranking, before and after the ranking update, shows that the journal upgrades were, at least on average, warranted and hence not driven by strategic voting behavior of researchers (see Appendix V-D). Rather, the journal upgrades seem to have corrected a former misalignment between the benefits of publishing in the respective journals and the associated costs of doing so, where the latter may be approximated by a journal's *SJR* value as an established outside criterion of journal quality. Hence, we are confident that our results can be trusted in picking up a causal effect. In an ideal setting, the ranking update would, of course, have to be completely exogenous. To be able to measure the effects of a change in the incentives to publish in treated versus untreated

journals, the exogenous update would have to take place in a way that the benefits and costs of publishing in treated versus untreated journals are not affected at the same time. As this may be difficult to achieve in a real world setting, future research might seek to address this point in an experimental setting.

Implications for Further Research

By exploring how researchers respond to changing incentives, our paper adds to recent research that analyzes the effects of (changing) incentives in academia (Blomfield and Vakili 2022; Buehling 2021; Śpiewanowski and Talavera 2021). With our difference-in-differences approach, we are the first to be able to estimate the *causal* effect of changing incentives, thus substantially extending previous research. Unfortunately, our setting does not allow us to analyze the effect of ranking downgrades (as they were descriptively investigated by Śpiewanowski and Talavera (2021)), because there are almost no downgrades in the journal ranking update we study. Hence, the investigation of causal effects regarding the downgrades of a journal rank is an open issue for future research.

In our second study we respond to the recent call by Śpiewanowski and Talavera (2021) to analyze potential heterogeneities between different groups of researchers. We are able to quantify the effects for different age groups of researchers as well as for different groups of researchers concerning their (quality adjusted) publication output prior to the ranking update. We find that younger researchers and those with a higher (quality adjusted) publication output respond more strongly to the ranking upgrades. In general, the benefits of publishing in highly ranked journals can be expected to be higher for younger researchers as these might have either not received tenure yet, or they might not have yet arrived at the place where they would ultimately want to work. For researchers with higher (quality adjusted) publication output, the (individual) costs of adjusting to different publication standards can be expected to be generally lower. Our findings are in line with the descriptive evidence presented by Walker et al. (2019) showing that typically (younger) researchers in junior or middle ranks rely more heavily on the use of journal rankings. Furthermore, we extend their findings by also documenting that researchers who are more actively publishing their work in academic journals seem to react more strongly to journal

upgrades compared to less active researchers. Yet, there is room for future research to further dissect researcher heterogeneity in terms of their response to changing incentives. For example, one might focus on differences between researchers in terms of their academic networks or the prestige of the institution at which a researcher is employed at the time of the update. Future research might shed more light on this.

Implications for Practice

Our study highlights the power of journal rankings on the publication behavior of researchers in terms of "you get what you 'pay' for" (Ayaita et al. 2019). Even though the researchers that we focus on in our study will hardly ever receive a direct monetary payment for having published in a journal of a particular rank, the fact that there are other tangible and intangible benefits attached to publishing in a higher-ranked journal does obviously guide researcher's publication behavior. While Ayaita et al (2019) have presented indirect and descriptive evidence for this to happen, we are able to causally identify and quantify this effect. Further, we have shown this effect to be stronger for the younger and the more active researchers.

Hence, journal rankings are by no means neutral or innocent, and using them to assess the publication performance of researchers is a sensible issue. If a journal ranking were biased in the sense that it overrated weak journals, the publication strategy of researchers for whom the ranking is relevant would likely be distorted. If the corresponding journal ranking is only relevant for a certain group of researchers (e.g., because it has only relevance for the researchers of a particular country or region), affected universities will be likely losing ground internationally. The risk that a journal ranking is biased and does not reflect the "true" quality of journals, will be most pronounced for journal rankings that are based on surveys – where survey participants might well strategically overrate their assessment of the journals they tend to publish in. Hence, department and university leaders are well advised to check the validity of journal rankings before basing, e.g., tenure or appointment decisions on these.

6. References

Adler, Nancy J., and Anne-Wil Harzing. 2009. When Knowledge Wins: Transcending the Sense and Nonsense of Academic Rankings. *Academy of Management Learning & Education* 8 (1): 72–95.

Aguinis, Herman, Chailin Cummings, Ravi S. Ramani, and Thomas G. Cummings. 2020. "An A Is An A": The New Bottom Line For Valuing Academic Research. *Academy of Management Perspectives* 34 (1): 135–154.

Ayaita, Adam, Kerstin Pull, and Uschi Backes-Gellner. 2019. You get what you 'pay' for: academic attention, career incentives and changes in publication portfolios of business and economics researchers. *Journal of Business Economics* 89 (3): 273–290.

Bajo, Emanuele, Massimiliano Barbi, and David Hillier. 2020. Where should I publish to get promoted? A finance journal ranking based on business school promotions. *Journal of Banking & Finance* 114.

Bäker, Agnes, Susanne Breuninger, and Kerstin Pull. 2021. Pushing performance by building bridges: Human and social capital as mechanisms behind the mobility-performance link. *Journal of Vocational Behavior* 129.

Balasubramanian, Parasuram, Victor M. Bennett, and Lamar Pierce. 2017. The wages of dishonesty: The supply of cheating under high-powered incentives. *Journal of Economic Behavior & Organization* 137: 428–444.

Blomfield, Michael, and Keyvan Vakili. 2022. Incentivizing Effort Allocation Through Resource Allocation: Evidence from Scientists' Response to Changes in Funding Policy. *Organization Science*.

Buehling, Kilian. 2021. Changing research topic trends as an effect of publication rankings - The case of German economists and the Handelsblatt Ranking. *Journal of Informetrics* 15 (3).

Chamberlain, Scott, and Christopher Baker. 2021. microdemic: 'Microsoft Academic' API Client. https://github.com/ropensci/microdemic.

Drivas, Kyriakos, and Dimitris Kremmydas. 2020. The Matthew effect of a journal's ranking. *Research Policy* 49 (4).

Eisend, Martin. 2011. Is VHB-JOURQUAL2 a Good Measure of Scientific Quality? Assessing the Validity of the Major Business Journal Ranking in German-Speaking Countries. *Business Research* 4 (2): 241–274.

Grossmann, Axel, Lowell Mooney, and Michael Dugan. 2019. Inclusion fairness in accounting, finance, and management: An investigation of A-star publications on the ABDC journal list. *Journal of Business Research* 95: 232–241.

Heckman, James J., and Sidharth Moktan. 2020. Publishing and Promotion in Economics: The Tyranny of the Top Five. *Journal of Economic Literature* 58 (2): 419–470.

Jokinen, Juho, and Jaakko Pehkonen. 2017. Promotions and Earnings – Gender or Merit? Evidence from Longitudinal Personnel Data. *Journal of Labor Research* 38 (3): 306–334.

Jones, Benjamin F. 2021. The Rise of Research Teams: Benefits and Costs in Economics. *Journal of Economic Perspectives* 35 (2): 191–216.

Korkeamäki, Timo, Jukka Sihvonen, and Sami Vähämaa. 2018. Evaluating publications across business disciplines: Inferring interdisciplinary "exchange rates" from intradisciplinary author rankings. *Journal of Business Research* 84: 220–232.

Lazear, Edward P. 2018. Compensation and Incentives in the Workplace. *Journal of Economic Perspectives* 32 (3): 195–214.

Lee, Sunkee, and Philipp Meyer-Doyle. 2017. How Performance Incentives Shape Individual Exploration and Exploitation: Evidence from Microdata. *Organization Science* 28 (1): 19–38.

Lounsbury, John W., Nancy Foster, Hemali Patel, Patrick Carmody, Lucy W. Gibson, and Deborah R. Stairs.

2012. An investigation of the personality traits of scientists versus non-scientists and their relationship with career satisfaction. *R&D Management* 42 (1): 47–59.

Madison, Guy, and Pontus Fahlman. 2021. Sex differences in the number of scientific publications and citations when attaining the rank of professor in Sweden. *Studies in Higher Education* 46 (12): 2506–2527.

Mingers, John, and Hugh Willmott. 2013. Taylorizing business school research: On the 'one best way' performative effects of journal ranking lists. *Human Relations* 66 (8): 1051–1073.

Myers, Kyle. 2020. The Elasticity of Science. *American Economic Journal: Applied Economics* 12 (4): 103–134.

Nkomo, Stella M. 2009. The Seductive Power of Academic Journal Rankings: Challenges of Searching for the Otherwise. *Academy of Management Learning & Education* 8 (1): 106–112.

Ong, David, Ho F. Chan, Benno Torgler, and Yang Yu. 2018. Collaboration incentives: Endogenous selection into single and coauthorships by surname initial in economics and management. *Journal of Economic Behavior & Organization* 147 (41-57).

Osterloh, Margit, and Bruno S. Frey. 2020. How to avoid borrowed plumes in academia. *Research Policy* 49 (1): 103831.

Rafols, Ismael, Loet Leydesdorff, Alice O'Hare, Paul Nightingale, and Andy Stirling. 2012. How journal rankings can suppress interdisciplinary research: A comparison between Innovation Studies and Business & Management. *Research Policy* 41 (7): 1262–1282.

Roach, Michael, and Henry Sauermann. 2010. A taste for science? PhD scientists' academic orientation and self-selection into research careers in industry. *Research Policy* 39 (3): 422–434.

Salandra, Rossella, Ammon Salter, and James T. Walker. 2022. Are Academics Willing to Forgo Citations to Publish in High-Status Journals? Examining Preferences for 4* and 4-Rated Journal Publication Among

UK Business and Management Academics. *British Journal of Management* 33 (3): 1254–1270.

Sauermann, Henry, and Paula Stephan. 2013. Conflicting Logics? A Multidimensional View of Industrial and Academic Science. *Organization Science* 24 (3): 889–909.

Śpiewanowski, Piotr, and Oleksandr Talavera. 2021. Journal rankings and publication strategy. *Scientometrics* 126 (4): 3227–3242.

Squazzoni, Flaminio, Giangiacomo Bravo, and Károly Takács. 2013. Does incentive provision increase the quality of peer review? An experimental study. *Research Policy* 42 (1): 287–294.

Stern, Scott. 2004. Do Scientists Pay to Be Scientists? *Management Science* 50 (6): 835–853.

Templeton, Gary F., and Bruce R. Lewis. 2015. Fairness in the Institutional Valuation of Business Journals. *MIS Quarterly* 39 (3): 523–539.

Valacich, Joseph S., Mark A. Fuller, Christoph Schneider, and Alan R. Dennis. 2006. Issues and Opinions—Publication Opportunities in Premier Business Outlets: How Level Is the Playing Field? *Information Systems Research* 17 (2): 107–125.

Walker, James T., Evelyn Fenton, Ammon Salter, and Rossella Salandra. 2019. What Influences Business Academics' Use of the Association of Business Schools (ABS) List? Evidence From a Survey of UK Academics. *British Journal of Management* 30 (3): 730–747.

Willmott, Hugh C. 2011. Journal List Fetishism and the Perversion of Scholarship: Reactivity and the ABS List. *Organization* 18 (4): 429–442.

Zhang, Haifeng, Junsen Zhang, and Yanfeng Zhang. 2019. Do tournament incentives matter in academics? Evidence from personnel data in a top-tier university in China. *Journal of Economic Behavior & Organization* 166: 84–106.

7. Appendix

Appendix V-A: Panel Regressions – Robustness Check

All upgraded journals

	(1)	(2)
	% Papers with at least one U.S. Author	% U.S. Authors
Mean LHS	0.4101	0.3262
Post Update	-0.0281***	-0.0435***
	(0.0060)	(0.0052)
Post Update x Upgraded Journal	-0.0007	-0.0063
	(0.0109)	(0.0088)
Journal Fixed Effects	Yes	Yes
Observations (journal-years)	4,584	4,584
R^2	0.0130	0.0407
F Statistic	27.5447***	88.6616***

Notes: This table reports the results of four difference-in-differences estimations where our dependent variables are based on U.S authors instead of authors affected by the journal ranking update. Panel A compares all upgraded journals with all journals that retain their original ranking. $Post\ Update_t$ is a dummy variable that equals one, for the years 2016 and later. The difference-in-differences estimator is $Post\ Update_t$ *x Upgraded Journal*$_k$, which indicates whether U.S. authors did increase their representation in upgraded journals in consequence of ranking update. In addition, we use journal fixed effects to control for any time-invariant journal characteristics. All models are estimated using journal-clustered standard errors. Significance levels are denoted as follows: *p<0.1; **p<0.05; ***p<0.01.

Appendix V-B: Panel Regressions on Ranking Heterogeneity – Robustness Checks

Panel A: VHB-journal-rank (A) to VHB-journal-rank (A+)

	(1) % Papers with at least one U.S. Author			(2) % U.S. Authors		
Mean LHS	0.6095	0.7964	0.5483	0.4798	0.6515	0.4227
Comparison group: Journals that retained their original … rank	(A+)/(A)	(A+)	(A)	(A+)/(A)	(A+)	(A)
Post Update	-0.0199*	-0.0339	-0.0146	-0.0420***	-0.0554***	-0.0369***
	(0.0105)	(0.0221)	(0.0117)	(0.0091)	(0.0188)	(0.0102)
Post Update x Upgraded Journal	0.0007	0.0147	-0.0046	-0.0398	-0.0264	-0.0449*
	(0.0205)	(0.0282)	(0.0212)	(0.0263)	(0.0311)	(0.0267)
Journal Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations (journal-years)	798	0.263	595	798	263	595
R^2	0.0092	0.0185	0.0056	0.0581	0.0871	0.0548
F Statistic	3.3937**	2.2538	1.5243	22.4668***	11.3972***	15.7528***

Panel B: VHB-journal-rank (B) to VHB-journal-rank (A)

	(1) % Papers with at least one U.S. Author			(2) % U.S. Authors		
Mean LHS	0.4441	0.5409	0.4218	0.3493	0.4183	0.3353
Comparison group: Journals that retained their original … rank	(A)/(B)	(A)	(B)	(A)/(B)	(A)	(B)
Post Update	-0.0226***	-0.0146	-0.0255***	-0.0400***	-0.0369***	-0.0411***
	(0.0071)	(0.0117)	(0.0086)	(0.0063)	(0.0102)	(0.0077)
Post Update x Upgraded Journal	-0.0214	-0.0295	-0.0186	-0.0239	-0.0271	-0.0228
	(0.0174)	(0.0197)	(0.0180)	(0.0155)	(0.0175)	(0.0162)
Journal Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations (journal-years)	2,299	785	1,764	2,299	785	1,764
R^2	0.0126	0.0160	0.0145	0.0421	0.0549	0.0424
F Statistic	13.4253***	5.8237***	11.8415***	46.2064***	20.8398***	35.6256***

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Appendix V-B continued from previous page

Panel C: VHB-journal-rank (C) to VHB-journal-rank (B)

	(1) % Papers with at least one U.S. Author			(2) % U.S. Authors		
Mean LHS	0.3523	0.3770	0.3212	0.2816	0.2985	0.2577
Comparison group: Journals that retained their original … rank	(B)/(C)	(B)	(C)	(B)/(C)	(B)	(C)
Post Update	-0.0303***	-0.0255***	-0.0362***	-0.0439***	-0.0411***	-0.0472***
	(0.0070)	(0.0086)	(0.0115)	(0.0061)	(0.0077)	(0.0097)
Post Update x Upgraded Journal	0.0059	0.0011	0.0118	0.0015	-0.0012	0.0049
	(0.0135)	(0.0144)	(0.0163)	(0.0105)	(0.0115)	(0.0129)
Journal Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations (journal-years)	3,536	2,256	2,022	3,536	2,256	2,022
R^2	0.0130	0.0123	0.0144	0.0363	0.0416	0.0365
F Statistic	21.2821***	12.8773***	13.4055***	60.7154***	44.7503***	34.7937***

Notes: This table reports the results of our difference-in-differences estimations regarding different levels of journal rankings. Panel A compares journals that receive an upgrade from A to A+ with journals that retain their original A and/or A+ ranking. Panel B compares journals that receive an upgrade from B to A with journals that retain their original B and/or A ranking. Panel C compares journals that receive an upgrade from C to B with journals that retain their original C and/or B ranking. $Post\ Update_t$ is a dummy variable that equals one, for the years 2016 and later. The difference-in-differences estimator is $Post\ Update_t\ x\ Upgraded\ Journal_k$, which indicates whether affected authors did increase their representation in upgraded journals in consequence of the ranking update as compared to the respective control group. In addition, we use journal fixed effects to control for any time-invariant journal characteristics. All models are estimated using journal-clustered standard errors. Significance levels are denoted as follows: *p<0.1; **p<0.05; ***p<0.01.

Appendix V-C: Tobit and Logit Regressions – Robustness Check

	(1) Tobit	(2) Logit	(3) Tobit	(4) Logit	(5) Tobit	(6) Logit	(7) Tobit	(8) Logit
	# Pubs Upgraded	Higher # Pubs Upgraded	# Pubs Upgraded	Higher # Pubs Upgraded	# Pubs Upgraded	Higher # Pubs Upgraded	# Pubs Upgraded	Higher # Pubs Upgraded
Mean LHS	0.6681	0.2340	0.6681	0.2340	0.6681	0.2340	0.6681	0.2340
Age < 40	2.3126***	1.2684***	2.0243***	1.1660***	1.4315***	0.9317***	1.6212***	1.0145***
	(0.3230)	(0.1950)	(0.2971)	(0.2017)	(0.2996)	(0.2077)	(0.2914)	(0.2107)
40 ≥Age < 50	1.2044***	0.6425***	0.9244***	0.5482***	0.5918**	0.4030**	0.6619**	0.4434**
	(0.2843)	(0.1776)	(0.2604)	(0.1807)	(0.2662)	(0.1847)	(0.2574)	(0.1866)
Top 20% Publication Activity			2.5300***	0.8388***			1.8721***	0.6184***
			(0.3066)	(0.1717)			(0.2900)	(0.1825)
Bottom 20% Publication Activity			-3.5877***	-2.0476***			-1.8068**	-1.4418**
			(0.7287)	(0.5879)			(0.7678)	(0.6456)
Top 20% Publication Quality					1.9599***	0.6406***	1.2433***	0.4269**
					(0.3064)	(0.1788)	(0.2804)	(0.1863)
Bottom 20% Publication Quality					-2.7426***	-1.2318***	-1.6550***	-0.6336**
					(0.3986)	(0.2823)	(0.4173)	(0.3140)

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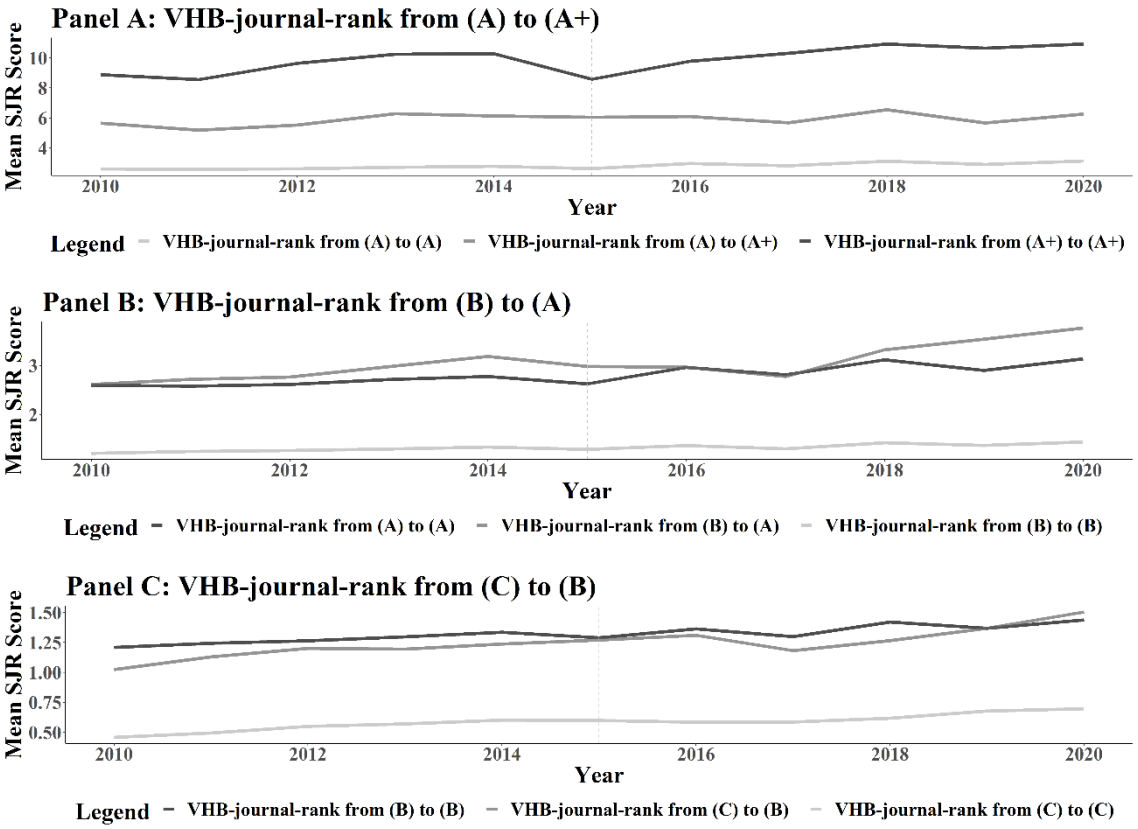
Appendix V-C continued from previous page

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Accounting	-0.6850**	-0.1174	-0.4499	-0.0423	-0.0010	0.1235	-0.0887	0.0862
	(0.2926)	(0.1902)	(0.2759)	(0.1970)	(0.2778)	(0.2019)	(0.2725)	(0.2037)
Business Information Systems	0.9145**	0.5180**	0.4106	0.4010	1.1730***	0.6266**	0.6909*	0.4949*
	(0.4662)	(0.2514)	(0.4060)	(0.2554)	(0.4106)	(0.2522)	(0.3902)	(0.2571)
Female	-0.3757	-0.0192	-0.1303	0.0811	-0.1341	0.0674	-0.0539	0.1056
	(0.3043)	(0.1898)	(0.2737)	(0.1946)	(0.2832)	(0.1945)	(0.2661)	(0.1952)
PhD German-speaking country	-0.3794	0.0262	-0.8298*	-0.1680	0.0442	0.1562	-0.4102	-0.0149
	(0.5290)	(0.2837)	(0.4760)	(0.2866)	(0.5023)	(0.3040)	(0.4783)	(0.3057)
Constant	-2.1162***	-1.8289***	-1.7349***	-1.7054***	-2.1325***	-1.8206***	-1.9721***	-1.7976***
	(0.5308)	(0.3125)	(0.4679)	(0.3083)	(0.5250)	(0.3433)	(0.4851)	(0.3359)
p-value for test: $Age < 40 = 40 \geq Age < 50$	0.0001***	0.0003***	0.0000***	0.0005***	0.0018***	0.0027***	0.0002***	0.0014***
Observations	1,124	1,124	1,124	1,124	1,124	1,124	1,124	1,124
AIC	2,608.7580	1,188.5409	2,464.0920	1,140.0278	2,479.0960	1,146.4892	2,429.1020	1,133.4801

Notes: This table reports the results of four different Tobit regressions and four different Logit regressions. Variable definitions can be found in Table V-3. All models are estimated using heteroscedasticity-robust standard errors. Significance levels are denoted as follows: *p<0.1; **p<0.05; ***p<0.01.

Appendix V-D: Average SJR Score by VHB-journal-rank



Notes: This figure displays average *SJR* values of journals with constant as well as upgraded rankings according to the *VHB-journal-rank*. Panel A compares journals that receive an upgrade from A to A+ (medium grey line) with journals that remain A journals (light grey line) respectively A+ journals (black line). Panel B compares journals that receive an upgrade from B to A (medium grey line) with journals that remain A journals (black line) respectively B journals (light grey line). Panel C compares journals that receive an upgrade from C to B (medium grey line) with journals that remain B journals (black line) respectively C journals (light grey line).

Affidavit

Ich erkläre hiermit, dass ich die vorgelegten und nachfolgend aufgelisteten Aufsätze selbstständig und nur mit den Hilfen angefertigt habe, die im jeweiligen Aufsatz angegeben oder zusätzlich in der nachfolgenden Liste aufgeführt sind. In der Zusammenarbeit mit den angeführten Koautoren war ich mindestens anteilig beteiligt. Bei den von mir durchgeführten und in den Aufsätzen erwähnten Untersuchungen habe ich die Grundsätze guter wissenschaftlicher Praxis, wie sie in der Satzung der Justus-Liebig-Universität Gießen zur Sicherung guter wissenschaftlicher Praxis niedergelegt sind, eingehalten.

Mario Fernandes, 10. August 2022

Submitted Papers

I. Fernandes, M. and Walter, A. (2022): Publication Behavior in Different Fields of Business Administration: From Anecdotal to Empirical Evidence. *Schmalenbach Journal of Business Research,* forthcoming.

II. Fernandes, M. and Walter, A. (2022): The Times They Are a-Changin': Profiling Newly Tenured Business Economics Professors in Germany over the past Thirty Years. *Working paper.*

III. Fernandes, M., Hilber, S., Sturm, J.-E., and Walter, A. (2022): Closing the Gender Gap in Academia? Evidence from an Affirmative Action Program. *Working paper.*

IV. Fernandes, M., Pull, K., and Walter, A. (2022): How do researchers react to changing incentives? Causal evidence from a journal ranking update. *Working Paper.*