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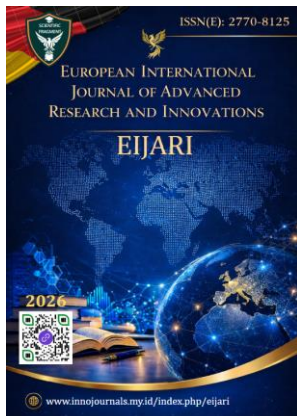
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A study of 25 years of publication outputs in the German academic profession

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Abstract. In the weak evaluation state of Germany, full professors are involved in the traditional social governance partnership between the state, and the self-governing higher education institutions (HEI) and disciplinary associations. Literature suggests that formal and informal governance could trigger changes in academics' publication behavior by valorizing certain publication outputs. In the article, secondary data from three surveys (1992, 2007 and 2018) is used for a multi-level study of the evolution of academics' publication behavior. We find a trend toward the "model" of natural science publication behavior across all disciplines. On the organizational level, we observe that a strong HEI research performance orientation is positively correlated with journal articles, peer-reviewed publications, and co-publications with international co-authors. HEI performance-based funding is only positively correlated with the share of peer-reviewed publications. At the level of individual disciplines, humanities and social sciences scholars adapt to the peer-reviewed journal publication paradigm of the natural sciences at the expense of book publications. Considering how the academic profession is organized around reputation and status, it seems plausible that the academic profession and its institutional oligarchy are key contexts for the slow but steady change of academics' publication behavior. The trend of changing academics' publication behavior is partly related to HEI valorization of performance and (to a lesser extent) to HEI performance based-funding schemes, which are set by the strong academic profession in the weak evaluation state of Germany.

Keywords: Academic profession · Germany as weak evaluation state · Valorization of performance · Performance-based funding · Publication outputs.

JEL Classification D73 · I23 · I28 · O35 · O38

Introduction. The changing expressions of academic excellence (e.g., Bol et al., 2018; Bourdieu, 1975; Clark, 1983; Cole & Cole, 1973; Merton, 1968) under managerial governance (e.g., Espeland & Sauder, 2007, 2016; Gläser, 2019; Marginson & Conside, 2000; Münch, 2014) are considered major international

trends affecting the publication behavior of academics. For example, World University Rankings (e.g., Johnes, 2018; Kauppi, 2018; Selten et al., 2020) and the Journal Impact Factor (e.g., Karpik, 2011; Larivière & Sugimoto, 2019) are considered major drivers of a metrification trend toward valorization of performance (VoP). The managerial transformation of qualities, such as creative ideas explained in academic publications, into quantities implies the construction of a “socio-calculative environment” (Vormbusch, 2012, p. 206; authors’ translation), in which valorization (“to valorize, to give worth to”; Vatin, 2013, p. 33) creates a circular process including evaluation and valuation (“assessment of value”; Vatin, 2013, p. 31). Such valorization is based on the natural science publication “model” (Cole, 1983; Heintz & Werron, 2011), which promotes publishing in refereed and listed English language journals, while monographs and contributions to edited books are considered less valuable. Accordingly, books are mostly not subject to indicator-led performance evaluation, which also affects publication cultures in humanities and the social sciences (e.g., Hammerfelt & de Rijcke 2015, Mathies et al., 2020). This valorization of performance (VoP) according to the natural sciences publication paradigm is executed top-down in “strong evaluation states” (Whitley, 2007, p. 9), such as Australia (e.g., Butler, 2003a, 2003b; Woelert & McKenzie, 2018), the United Kingdom (e.g., Moed, 2008), South Korea (e.g., Choung & Hwang, 2013; Shin & Lee, 2015; Shin et al., 2009) and other East Asian countries (e.g., Lyu et al., 2017; Park et al., 2016). In comparison to Australia, South Korea and the UK, Germany is a weak evaluation state (Gläser, 2019; Schimank, 2010). In the absence of federal jurisdiction, the higher education and science laws of the 16 federal states stress higher education institutions’ (HEI) autonomy. HEI leadership and academic self-governance bodies (e.g., academic senate) are responsible for applying performance evaluations or not (Huber & Hillebrandt, 2019). Accordingly, in the weak evaluation state Germany, the organizational level has to be considered as well as the natural science publication paradigm when studying possible changes in academics’ publication behavior. The goal of this study is to empirically observe the changes in individual publication behavior of academics by answering two research questions (RQ):

RQ1: Can we observe a convergence of other disciplines to the natural science model of publication?

RQ2: Are HEIs’ performance orientation and performance-based funding policies connected to changes in academics’ publication behavior? Using three surveys, we can study the changing publication behavior in the German academic profession by looking at publication outputs over the course of the last 25 years (1992–2007–2018). Using surveys allows us to consider multiple types of publications. Databases such as Web of Science would not be appropriate, as they do not comprehensively cover all humanities and social sciences publications, such as books, non-peerreviewed articles and non-English journals (Chi, 2015; Ossenblok

et al., 2014). Therefore, our study can complete the picture especially with regard to humanities and social sciences in a non-native English language country (see Puuska, 2014 for limitations of surveys). We proceed as follows: In "A literature-based description of VoP in Germany" section, we present a brief overview of the German higher education and science system as a weak evaluation state. In "Data" section, we describe the data that we use to answer the research questions. We use surveys conducted at three different points in time (1992, 2007 and 2018). Section "Methods" presents the methods, section "Results" the results, which are discussed and concluded in "Discussion of results and conclusions" section.

A literature-based description of VoP in Germany Brief overview of the German higher education and science system In Germany, academics benefit from relatively strong protection against interference by the state in their research and teaching on the basis of the German constitution (Grundgesetz article 5(3)1) and are granted a relatively strong position in higher education and science governance. In the social partnership (Sozialpartnerschaft) between the state and the academic profession (Stichweh, 1994; see also: McClelland, 1990; Schimank, 2005; Scott, 2005), the strong academic oligarchy¹ in positions such as HEI leadership, academic senates, national academic bodies (e.g., German Rectors' Conference and German Science Council (Wissenschaftsrat)), etc. (Brennan, 2010; Pusser, 2008) influences law making and how the law is applied. For example, since 2005 the law on the so-called W-remuneration (Professorenbesoldungsreformgesetz) (Klenke, 2012; Annex 1) enables agreements between HEIs and academics on goals – similar to private corporations (Vormbusch, 2012). Another example for the German reward for compliance scheme is the so-called Excellence Initiative (IECEI, 2016; Mergele & Winkelmayr, 2021; Schubert et al., 2017). Accordingly, we differentiate the term VoP to capture the different forms of HEI organizational governance that internally emphasize a performance orientation from their affiliated academics. The most explicit examples for VoP are performance indicators and performance-based resource allocation (Hammarfelt & de Rijcke, 2015; Laudel & Gläser, 2006; Orr et al., 2007). These instruments commonly valorize the academics' performance on the basis of publication indicators and third-party funding (Gralka et al., 2019; Selten et al., 2020). However, organizational performance valorization is not limited to metric indicators. As Huber and Hillebrand (2019) underline, performance agreements between HEI management and academics are important instruments in the current organizational governance of performance that are based on "future expectations of success instead of measurable success" (p. 260). Thus, VoP also includes informal aspects of an organizational performance orientation.

Following the German tradition of rewards for compliance, the Excellence Initiative in particular actively constructs an environment based on the natural

science research model and publication paradigm by rewarding universities according to publication outputs, third-party funding input, and large research clusters (DFG, 2013; IECEEI, 2016; Mergele & Winkelmayr, 2021). Although, for example, Gerhards (2014) claims that German higher education and science governance are overly fixated on third-party funding, Schubert et al. (2017), for example, show that the so-called Excellence Initiative has had some impact on academics' publication behavior across all disciplines. In line with efforts by the 16 German federal governments to strength HEI leadership in the context of HEI autonomy, the organizational level is formally responsible for the (non-)establishment of evaluation and reward schemes for publications, third-party funding, etc. (Bloch et al., 2021; Gläser & Laudel, 2019).

Germany as weak evaluation state. In Germany, the 16 states enable performance-based reward distribution and performance agreements by law but do not define measures and criteria, devolving this task to the academic senate and HEI leadership (e.g., Berlin 2011, § 8; Berlin 2018 [1996], § 3.3; Hesse 2009, § 36, § 37). Within the legal framework set by the state, HEI leadership, supported by boards and academic senates, exercises the relative autonomy of (not) setting evaluation criteria and establishing performance agreements in very different ways. As a result, university autonomy and academic self-governance has created a patchwork of (non-) application of organizational performance-based reward distribution across HEIs in which organizational VoP does or does not interlock organizational and individual development (Vormbusch, 2012; Huber & Hillebrand, 2019).

Accordingly, Germany can be attributed Whitley's (2007) label "weak evaluation state" where state VoP pressure is generally lower compared to strong evaluation states (e.g., Deem et al., 2008; Hicks, 2012; Zacharewicz et al., 2019). Already at the turn to the twenty-first century, Butler (2003a) observed a dramatic increase in the quantity of journal articles as a reaction to the introduction of efficacy- and performance-based funding in Australia. For South Korea, several studies found evidence for an increase in refereed journal publications (Kim & Bak, 2016; Park et al., 2016; Shin et al., 2021) and co-authorship (Lyu et al., 2017), which is interpreted as a response to the state-set introduction of performance-based funding formula. In the UK, the application of principal evaluation criteria in the Research Assessment Exercise (now termed Research Excellence Framework (e.g., Bloch et al., 2021)) also produced a response in terms of publication behavior (Moed, 2008). In Northern European countries, we can observe a combination of managerial approaches to reward efficacy and excellence in the introduction of national publication registers (e.g., Finland: Mathies et al., 2020; Norway: Aagaard et al., 2015; Denmark: Ingwersen & Larsen, 2014). These publication registers can be used to reward both quality and efficacy by establishing a point system and different ranks of publications. In doing so, quality publications, defined by

Journal Impact Factor ranking schemes, are rewarded, while academics publishing in lower class media may challenge the efficacy, for example as observed in Australia (Butler, 2003b). Mathies et al. (2020) show for Finland that after establishing a national publishing register that rewards organizations whose researchers publish according to the system, the number of English language contributions increased, especially in humanities and social sciences, whereas the number of book publications decreased. In Norway, journal articles in the reputable Web of Science increased (Aagaard et al., 2015).

Initial cautious conclusions about publication behavior changing towards the natural science publication paradigm can be drawn based on the findings of RQ2 (organizational level) and the relative insignificance of performance-based funding for individual professors' salaries (Klenke, 2012; Wilkesmann & Schmid, 2012; for Norway, see Aagaard et al., 2015; for US see, Leahey, 2007). The results underline that especially the non-monetary and to a lesser extent the monetary elements of VoP are associated with academics publishing increasingly in peer-reviewed, English language journals (e.g., metrified by the Journal Impact Factor), while other publication formats are unaffected. Thus, VoP seems to drive academics to orient themselves towards journal publications, which are part of the main indicators in the (rankingdriven) international competition between HEIs (e.g., Selten et al., 2020). We consider the close relationship between the so-called Excellence Initiative and VoP (DFG, 2013; IECEEI, 2016) one possible explanation. The significant positive correlation between the share of publications co-authored with academics abroad and organizational performance orientation, make it plausible that HEI policies for internationalizing research and HEI policies on VoP correspond. This is in line with research on internationalization, which emphasizes that research intensity and international orientation are connected to the image of a "global model" (Mohrman et al., 2008, p.6) of research universities. For example, Gao (2015) argues that HEI managers are aware of the correlation between international research cooperations and more publications, which result in a higher impact of research (e.g., more citations). In addition to changing publication behavior being pushed by ranking and the (global) battle for excellence, the results of this study again point to the key role of the academic profession and its institutional academic oligarchy. With few exceptions, the results of this study for Germany show a similar publication trend to other, strong evaluation countries (e.g., Hicks, 2012; Matthies et al., 2020; Zacharewicz et al., 2019). For Germany, this suggests that the absence of a state-set evaluation system and the associated label "weak evaluation state" does blur a non-existing system-level difference for changing academics' publication behavior across all disciplines. Accordingly, "weak evaluation state" cannot be considered the key or single explanatory heuristic. The key explanation for the change in German academics' publication behavior is the German academic profession and its

Scientometrics (2022) 127:1–28 23 1 3 institutional oligarchy in disciplinary organizations as well as HEI leadership. This suggests that in the social partnership between the academic profession and the German state, the academic profession is establishing a strong evaluation state, which is not alien to academic VoP and connected reputation gain.

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