

"The fact that hazard rather than ability plays so large a role is not alone or even predominantly owing to the 'human, all too human' factors, which naturally occur in the process of academic selection as in any other selection. It would be unfair to hold the personal inferiority of faculty members or educational ministries responsible for the fact that so many mediocrities undoubtedly play an eminent role at the universities. The predominance of mediocrity is rather due to the laws of human cooperation, especially of the cooperation of several bodies, and, in this case, cooperation of the faculties recommend and of the ministries of education." (WEBER (1919))

1. Introduction and research question

The reform of the professor remuneration at German universities, which was passed in 2002, introduced economic instruments in terms of objective agreements and performance evaluation to the university and the faculty. One of the main aspects of the reform is a performance-dependent remuneration of professors by a special performance bonus which is organized as a relative rank-order tournament within the departments. The professor's remuneration ("W-Besoldung") is based on §33 (1) of the German Federal Salary Law ("Bundesbesoldungsgesetz"): Professors earn a fixed baseline salary on which different performance-dependent components can be added. There are three types of bonuses: one for administrative service e.g. as a dean ("Funktionsleistungszulagen"), one for job offers from external faculties in order to prevent poaching ("Berufungs-/Bleibezulagen") and one for particular achievements in research, teaching, art, advanced training and the promotion of young researchers ("besondere Leistungsbezüge"). The latter is organized as a performance-dependent salary awarded in departmental rank-order tournaments between the incumbent professors of a faculty.¹

This new remuneration has been widely criticized by scholars. Especially, the performance-dependent salary components have evoked much criticism. One of the major drawbacks of departmental rank-order tournaments concerns the selection of new faculty members: Performance-dependent remuneration leads to adverse incentives regarding the appointment of new professors. There is an incentive not to choose the best available candidate (HUFNAGEL/MÜHLENKAMP (2002), HARBRING/IRLENBUSCH/KRÄKEL (2004) and KRÄKEL (2006)).

In fact, faculties face a trade-off when hiring new professors: On the one hand, hiring a good candidate increases the overall reputation of the faculty and members benefit from joint research. Cooperation with (good) professors leads to new projects, attracts research grants and results in (high quality) publications ultimately increasing the reputation not only of the individual but of the entire faculty (HAMERMESH/PFANN (2009)). This effect is described as a "spill-over effect".

On the other hand, the new professor becomes an opponent in future tournaments for

¹The details of the awarding procedures are regulated by the federal state laws and by the higher education institution using salary guidelines. For an analysis of these guidelines, a discussion of the performance-dependent remuneration and the different tournament types for awarding the bonus, see LÜNSTROTH (2009).

special performance benefits. The incumbents fear a decrease of their individual salary as the new professor might outperform them. Therefore, they try to foster their own position within the tournament by choosing an inferior competitor. This effect is called "relative deprivation"². Summing up this trade-off, the benefit of appointing a good new professor lies in the increase of the faculty's reputation, resulting in a higher overall budget and/or individual income. The cost of appointing a good candidate is the foregone performance-dependent salary given a lower rank in the faculty tournament and the reduction in the budget available due to the higher wage bill.

One possibility to analyze this trade-off is illustrated by VIERØ (2010). The author develops an equilibrium sorting model with researchers who care about their compensation and their relative status within the university. In equilibrium, the top of the ability distribution is allocated to academia while the bottom takes the outside option. This result is dependent on the size of the outside option and with a higher value of the alternative career the differences in quality between the universities diminish. Her study differs from the approach taken in this paper, as the sorting is made from the point of view of the researchers (the agents) whereas this paper looks at the appointment decisions from the perspective of the incumbent faculty and the university (the principal).

The problems associated with delegating personnel decisions are not unique to universities: FRIEBEL/RAITH (2004) identify the "abuse of authority" in the hiring decisions of companies. Managers trade off the overall success of the company against their personal career prospects. Superiors might recruit less able subordinates to protect themselves from being replaced by a better candidate even though this decision might have negative effects on the company's success. EBERLEIN/PZERMECK (2008) recognize similar decisions in their experimental study on personnel selection. The authors identify strategic considerations of managers when deciding on an employee: Better managers choose the best available candidate, whereas weaker managers decide in favor of an employee whose appraisal is considered (slightly) worse than the appraisal of their own achievement in order not to weaken their position. SENGUPTA (2004) studies delegation of recruitment to senior employees who are better able to judge the candidates abilities, but who may avoid hiring the best candidate as they fear a threat of their seniority. The author shows that moral hazard may exist given asymmetric information going beyond the type of the candidate. He suggests tenure to ascertain that the best candidate is selected.

Albeit these results for the non-academic world, it is important to examine the situation in the university in particular. The differences between companies and higher research and teaching institutions are manifold. SLOW (1995) identifies the following specifics of the North American market for professors: peer review in publications, hiring and promotion decisions, up-or-out rules for junior researchers after a finite probationary period, tenure after the appointment to a full professorship as well as a negative seniority

²RUNCIMAN (1966) introduced the notion of "relative deprivation" in sociology. Years later, it was transferred to economics and STARK (1990) applied this concept to relative rank order tournaments. A person feels relatively deprived when his income is lower than the income of a chosen reference group.

wage premium. In Germany, peer-review, up-or-out rules³ and granting tenure, which means the appointment as a civil servant, are common as well. Some specifics of higher research and teaching institutions are apparent from the personnel decisions in particular. The appointment of a professor is a long-term decision as tenure makes it possible that some professors hold a chair until retirement. The appointment decision is made by the faculty itself and not by university governance. Faculty appointment is a typical example for cooptation – the self-complementation of a group – a practice which is rarely found in companies. In addition, the incumbent professors have to work together with the newly appointed colleague in departmental committees or in joint research projects. This makes the achievement of one professor dependent on the effort and good-will of another. Traditionally, tenure is meant to guarantee the appointment of the best available candidate to the faculty (CARMICHAEL (1988)). But with the performance-dependent salary, colleagues become competitors in rank-order tournaments: The gain of one professor is the loss of the other. Thus, strategic considerations in appointment committees become more and more important.

This paper focuses on the trade-off between the effect of the relative deprivation caused by an inferior position in the rank-order tournament, and the spill-over effect through joint research within the university. Is the appointment committee searching for the best? Whom will they choose? In other words, which effect dominates the recruitment decision – relative deprivation or spill-over? As data on appointment decisions in German universities is difficult – if not impossible – to obtain, a theoretical approach is being taken. The faculty’s decision is modeled following the tradition of the literature on clubs and their admission policies. It is analyzed which effect dominates faculty appointment and potential remedies are proposed.

The paper is organized as follows: The following section gives an overview of faculty appointment at German universities, followed by a discussion of the related literature in second 2. The third section starts with the baseline model of PRÜFER/WALZ (2009) and then is extended by introducing special performance benefits awarded in a contest. Section 4 characterizes the equilibrium in this setting by analyzing the faculty’s choice and the candidate’s decision. Section 5 concludes the paper by out of the model predictions and illustrations of different applications. Finally, testable hypotheses are derived.

2. Literature Review

2.1. Faculty appointment in German universities

In Germany, the federal states have sovereignty over cultural policy. Consequently, they are in charge of the educational policy as well. In order to assure comparable standards in all states the federal government provides legal guidelines for institutions of higher

³In Germany, professors typically are recruited externally. Internal promotions from junior researcher to full professor within one faculty are very restricted. Nonetheless, junior researchers just get contracts for six years as post-docs (§2 German Federal Academic Temporary Contract Law (“Wissenschafts-Zeitvertragsgesetz“)).

education ("Hochschulrahmengesetz", HRG). The federal states are allowed to formulate these guidelines into state laws that meet their needs.

§37 (1) HRG states principals of participation in universities: Committees have to consist of members of the different status groups – professors, academic staff (everybody without a professorship, e.g. PhD students, Post-Doc Researchers, teaching and research assistants), students and other, non-academic staff. Most federal state laws provide even more specific guidelines, e.g. with respect to the numbers for each status group involved. For example, decisions concerning teaching and research must be passed with a majority of the professors' votes.

Traditionally, faculty appointment is prepared by an appointment commission invested by the departmental committee ("Fachbereichsrat"). On average, this commission consists of five professors, two students and two members of the academic staff. They decide on a list ranking three candidates that are suitable for the vacant chair. This list is then approved by the departmental committee. Afterwards, the ministry makes the final decision on which candidate from the list to appoint.⁴

MUSSELIN (2005) looks at the differences and similarities in the French and German academic labour market. She derives four dimensions of comparison: the selection devices, the length and role of pre-tenure period, the balance between internal and external labour market and the determination of the price of the academics. Especially the first dimension is discussed in greater detail in MUSSELIN (2002)*a* and MUSSELIN (2002)*b*. By interviewing researchers about their experiences with appointment decisions, she identifies different mechanisms by which the candidates are selected. The definition of what makes a good candidate varies between the departments and so do the requirements and their weight in the decision process. Two different sets of factors can be distinguished: criteria and signs. The former category consists of information that lead to elimination of the candidate if missing or not appropriate (e.g. number and quality of publication, field of specialisation). The latter category consists of information that is supplementary and on its own not sufficient for an appointment (e.g. personal trust, collegiality). A number of positive signals may lead to a positive assessment of the candidate. The author comes to the conclusion that "everyone is looking for the "best" [candidate] but what is meant by "the best" varies from one department to the other" (MUSSELIN (2002)*a*, p. 4). Between the two extremes, "top researcher" and "good citizen", a variety of possibilities exists. This difference may be a part of an explicit differentiation strategy of the universities or due to specific (institutional) constraints. Furthermore, the author points out that in academic labour markets the adjustment between supply and demand is not made over price but rather over quality. This is perceived as an example of "economy of quality" (MUSSELIN (2002)*a*, p. 7). The recruitment is considered as a twofold procedure in which first an assessment of the candidate is made and second the price⁵ is determined. This mechanism will be important in the modelling section, as in a first stage the universities set minimum entrance requirements the candidates need to

⁴For a summary and critique of the chair system in German higher education see ENDERS (2001).

⁵The salary is set according to given institutional standards, but the endowment of the position and some additional wage components can be negotiated with the university's administration after the recruitment.

fulfil which then help to define the wage in a second stage.

In general, professors hold the majority in university commissions. Although students and academic staff are part of the committees, their influence is often very limited. There is numerous anecdotal evidence of assistants and students not daring to oppose professors. DAHME/HENKEN/NEUBAUER (1980) conduct a study of the speaking time in departmental committees. They recognize that professors dominate the committees not only by number, but also by speech. Academic staff and students are dependent on professors as their supervisors and teachers. Therefore, these groups rarely oppose them. Consequently, the following analysis concentrates on the behavior of professors in appointment commissions.

Looking at the group of professors, two types can be distinguished: "cosmopolitans" and "locals", as characterized for the university faculty by GRIMES (1980). BACKES-GELLNER (1989) applies this concept to German universities. Generally, "cosmopolitans" are characterized as having little loyalty to the employing organization, being highly committed to professional role skills and using an external reference group for orientation. As for the faculty, "cosmopolitan" members publish more, are less active in department governance and administrative services and hold more offices in (external) professional organizations. In contrast, "locals" show high loyalty, little commitment and an inner reference group orientation. In other words, they mostly pursue recognition in their own university via departmental service (GRIMES (1980), 196f.).

One might speculate that the members of these two groups favor different candidates for an appointment: A "cosmopolitan" might emphasize the importance of a good publication list, whereas a "local" might prefer a candidate who has done a lot of departmental service. With his inner reference group orientation, the "local" cares about the outcome of the departmental rank-order tournaments for performance-dependent salary. Therefore, the effect of relative deprivation might be more prevalent with "locals" than with "cosmopolitans". The latter have an external reference group orientation and for them, salary increases due to an external job offer from another faculty ("Berufungs- und Bleibe-Zulage") might be of higher importance.

Another strand of the literature mainly focuses on the objective determinants of a successful appointment. FIEDLER/WELPE (2008) interview German university professors in economics and business departments on their preferences when searching for new faculty members. They identify the attitude towards the university system and in particular towards its change as critical factors for the appointment decision. The higher the approval for the changes in university governance, the more emphasis is given to high-quality journal publications and international experience of the candidate. If the interviewees are content with the current university system, they prefer candidates with high-quality monographs and the "Venia legendi" (formal teaching qualification to become a professor in German universities). Furthermore, SCHLINGHOFF (2002) establishes the reputation of the PhD-granting faculty and the publication list with special emphasis on high-ranked German journals as key determinants for a successful application.

ZINOVYEVA/BAGUES (2010) find empirical evidence for discrimination in Spanish promotion committees. The decision whom to approve depends on the composition of the

appointment committee: When applying for an associate professor position, females are less likely to be appointed when they are judged by a committee with relatively larger share of female evaluators. And on the contrary, when applying for a full professor position, females are less likely to be promoted when they are judged by a committee with a relatively higher share of male evaluators. Other factors beside the gender composition of the appointment committee have little or no influence the decision: the age structure does not significantly affect the chances of success of the candidates, a committee of relatively better researchers has a slightly higher tendency to approve female candidates and an evaluator from the candidate's home institution increases the candidate's chance to get promoted by 70%.

As we have seen, there are different determinants of the appointment decision. Objective and subjective criteria exist. Different groups as well as single members of the faculty might try to influence or even to manipulate the appointment decision in their favor.

2.2. Voting Systems

There are different ways of looking at appointment committees and analyzing their decision making. To begin with voting procedures will be discussed followed by voting in committees.

As the federal law does not state any explicit voting procedure, the universities and sometimes even every appointment committee are free to decide on a voting mechanism. Therefore, agenda manipulation (MCKELVEY (1976)) and strategic voting⁶ can be found in appointment committees. One possible way of manipulation is the ordering in which candidates are discussed as it may influence the candidate's chances of being appointed. Often, candidates are compared in pairs: Suppose that the person in charge of the agenda, the chair of the appointment committee, favors a particular candidate. The chair can then ensure that his favorite applicant makes progress by comparing him to very weak candidates.⁷ Another way to influence the outcome is to introduce the favored candidate at a later stage of the decision process. Consequently, this applicant faces a fewer amount of polls which he has to win and has thus a greater chance of being appointed.

Besides the influence through the voting procedures, the composition and the size of the deciding committee plays a crucial role. LEPELLEY/VALOGNES (2003) show that for a small electorate of nine people the manipulability of voting rules decreases when social homogeneity increases. This is good news for the situation in appointment committees if we assume a high homogeneity among the professors. But this homogeneity must not be the case: For example in larger faculties, which are composed of different departments, heterogeneity might prevail. Or there might exist different attitudes toward good research (e.g. applied or theoretical reasoning, qualitative or quantitative research).

So far, the results are applicable for every voting decision. When looking at personnel

⁶This is obvious from the Gibbard-Satterthwaite theorem concerning the determination of just one candidate (GIBBARD (1973); SATTERTHWAITE (1975)) and respectively, Arrow's theorem for the ranking of candidates on a list (ARROW (1963)).

⁷This strategy is comparable to seeding in tournaments.

selection in committees, another phenomenon becomes evident. BARBERÀ/MASCHLER/SHALEV (2001) identify so-called "voting for voters": In a club, members decide who is allowed to join. In this setting, voters must acknowledge the fact that newly elected members will become voters in later elections: "this may lead to postpone the election of individually attractive candidates who might vote in unattractive ways, or to accelerate the election of a poor candidate whose early election may prove useful." (BARBERÀ/MASCHLER/SHALEV (2001), p. 41).

Concerning "voting for voters"-strategies in appointment commissions, one can identify different reasons why a persons would vote for or against a candidate: First, he may vote for a very talented candidate of whom he assumes that he will contribute positively to the status and reputation of the faculty. Second, he may vote to admit a candidate that will help to recruit other desirable candidates in the future. In contrast, he may vote against a highly desirable candidate, fearing that he may recruit undesirable professors in the future. And finally, he might not want to admit a candidate as he fears a relative deprivation of his salary.

One example of a club is a university faculty; incumbent professors decide among themselves in an appointment committee who can join and become a member of the faculty. In this setting, there may be more reasons to vote for a particular candidate: In a department, different fields of research may exist. Imagine a mathematics department in which theoretical research and applied research is undertaken. Depending on the current numbers of theoretical and applied professors, one group may have an incentive to vote for a candidate who ensures the majority of their group although he might not be as qualified as a candidate belonging to the other group. In the future, this decision will ensure that one group, say the applied mathematicians, will have the majority in all commissions deciding on budgets, teaching, new hiring and so on.

Summing up, the possibilities of influencing the decision of an appointment committee are numerous. There is ample scope to manipulate against a selection of the best-possible candidate. The next subsection elaborates the notion of academic faculty as a club and status organization.

2.3. Academic faculty as a club

There is a large body of literature that focuses on clubs, their admittance decisions and their optimal size beginning with BUCHANAN (1965).⁸ SANDLER/TSCHIRHART (1980) define a club as a "voluntary group deriving mutual benefit from sharing one or more of the following: production costs, the members' characteristics, or a good characterized by excludable benefits" (p. 1482). A club in which members' characteristics play a dominant role can be described as a status organization. HANSMANN (1986) defines a status organization by using three characteristics: exclusivity, stratification and cooperative control.⁹ Following this broad classification, university faculty is a status organization

⁸For an overview, see SANDLER/TSCHIRHART (1980), (1997).

⁹In a very similar notion, BASU (1989) defines the membership of clubs and societies which restrict admission to social elites and distinguishes persons as a classic association good where status is

and therefore a club: A professor "will commonly choose employment with a particular university not just, or even primarily, on the basis of work conditions such as salary and teaching load, but also on the basis of the professional accomplishments of the other members of the faculty." (HANSMANN (1986), 119f.).

In the following, a university faculty is described as a club and status¹⁰ is defined as a rival good with a high possibility of excludable benefits. Status refers to "the degree to which an individual exhibits those attributes that make him desirable as a fellow patron in the organization" (HANSMANN (1986), p. 120). The author points out that the utility "an individual derives from membership in a given club depends (...) on the *average* status of the clubs membership (including the individual in question)" (HANSMANN (1986), p. 122). This definition gives the intuition for the utility function defined in the next section.

The importance of status and relative status positions has been elaborated by FRANK (1985). People care about their position in the pecking order and are willing to pay for status, e.g. employees accept lower monetary compensation in exchange for higher status. PODOLNY (1993) extends this assumption to competition between firms in a market and concludes that potential employees in higher-status firms can be acquired at a lower cost than at a lower-status employer.

Preceding, the notion of faculty as a status organization and a club was established. Now, the trade-off between the utility a professor receives via the average status of the faculty and the utility resulting from his outcome in the rank-order tournament has to be determined. The underlying questions remain: Will the spill-over effect dominate the effect of relative deprivation? Is the appointment committee searching for the best candidate and will they appoint the most qualified and suitable candidate? Or, will strategic considerations, like the fear of relative deprivation or "voting for voters" considerations, influence the recruitment decision?

3. The model - Clubs and their admission decisions

PRÜFER/WALZ (2009) analyze the implications of governance structure (in particular voting mechanisms) on recruitment decisions of universities. They model a trade-off between the effect of entry on the average status of the faculty and the alternative uses of the recruitment budget if no new professor is appointed. My paper extends their framework by explicitly incorporating the actual professor's remuneration in Germany, which in turn allows for relative performance pay. By this, it is possible to analyze the trade-off between spill-over effect and relative deprivation.

The following subsection gives a short summary of the results of PRÜFER/WALZ (2009). Subsequently, the extension of relative performance remuneration is introduced and discussed in detail.

associated with the admittance (p. 654).

¹⁰There is a large literature in sociology and economics on social status and its influence on economic performance, for an overview see: WEISS/FERSHTMAN (1998). Often, social status is shared by a particular group, e.g. a particular occupation, and therefore it is described as a collective good.

3.1. The baseline model by Prüfer/Walz (2009)

The authors model competition for professors in a two-faculty framework. The two universities differ in their ranking, modeled as different average status levels of incumbent professors. Every faculty member is endowed with status which is a one-dimensional, vertically differentiable type variable. Thereby, it is defined as a good with some degree of rivalry. Status can be interpreted in different ways: It creates utility via reputation, interaction and exchange (PRÜFER/WALZ (2009), p. 5). Faculty members face a trade-off between the utility they receive via the average status level of the other members of the faculty and alternative uses of the hiring budget without an appointment. The utility of an incumbent professor is given by his utility from the average status of the faculty plus a share α of the budget available for the wage of the new professor.

The competition for candidates is modeled as a two-stage game: In the first stage, faculties determine the minimum entrance status for a candidate and his wage. In the second stage, the candidate decides which offer to accept. The authors show that the best professors join the best faculties, but that they receive lower wages than a slightly less talented candidate in a lower-ranked department (PRÜFER/WALZ (2009), p. 12). Furthermore, they show that faculty members with a low status benefit more from joint research than members with high status. Consequently, low status members are more restrictive concerning appointment decisions than high status professors (PRÜFER/WALZ (2009), p. 2) as status is a rival good. Every professor has a fixed amount of resource (time, effort) to interact with other faculty members. If the number of researchers increases, interaction with a single professor decreases on average (PRÜFER/WALZ (2009), p. 5). Therefore, low status professors set higher entry standards for new faculty members. Finally, different voting rules are analyzed and a dominance of majority voting is deducted. This result is strengthened by AYRES/ROWAT/ZAKARIY (2010) who claim that double consensus (in the American university system: at the hiring and at the tenure stage) is never optimal.

Some of the results by PRÜFER/WALZ (2009) seem contra-intuitive to the real world. My extension, the introduction of relative performance remuneration, triggers a different trade-off. In the remainder of the paper, the trade-off between the spill-over effect through joint research and the relative deprivation through a bad starting position in the rank-order tournament is discussed.

3.2. Introduction of relative performance pay

Let us consider two faculties $j \in \{H, L\}$, with different distributions of status levels (e.g. research and teaching quality) and $N_j \in \mathbb{N}$ members.¹¹ Both want to hire a new professor. As in the baseline model, every professor i is endowed with status s^i – a one-dimensional, vertically differentiable type variable. Status positions are drawn from a distribution over $[\underline{s}, \bar{s}]$.¹² In accordance with HANSMANN (1986), the higher the status

¹¹The notation follows PRÜFER/WALZ (2009). Superscripts denote individual professors, subscripts denote faculties.

¹²More formally, status is a random variable with $S^i : (\Omega^i, \mathcal{A}^i) \rightarrow ([\underline{s}, \bar{s}], \mathbb{B}([\underline{s}, \bar{s}]))$ where (Ω, \mathcal{A}, P) is a probability space and $(\mathcal{X}^i, \mathcal{F}^i) = ([\underline{s}, \bar{s}], \mathbb{B}([\underline{s}, \bar{s}]))$ be a measurable space and $\mathbb{B}([\underline{s}, \bar{s}])$ is the Borel

of an individual, the more valuable he is for his colleagues. Professors might benefit from social exchange and subject-specific discussions, advise on drafts and publication strategies, superb writing skills or outstanding teaching abilities. The professor with the highest status in a faculty j is called \bar{n}_j , the one with the lowest status \underline{n}_j .

The budget B of a faculty is given exogenously by the university's president or the ministry. The budget is assumed to be identical in both faculties as to let status differences between the faculties be decisive. After deciding on a candidate, the faculties offer a wage $W_j \leq B$ to the new professor. If an appointment takes place, the difference $\bar{B} = B - W_j$ is used for special performance-pay awarded according to a Tullock contest success function¹³ within the department (TULLOCK (1980)). The status of a professor is decisive for the allocation of the performance-dependent salary components. The fraction of the status of a professor relative to the total status of the faculty $\sum_{i \in j} s^i$ determines his share.¹⁴ Without an appointment, the whole budget B is spent on performance-dependent remuneration.

For professor k in faculty j the average status of all the other members of the faculty is given by:

$$\hat{s}_j^k = \frac{\sum_{i \in j} s^i - s^k}{N_j - 1}.$$

When a new professor with status s^C joins a faculty, the average status changes respectively:

$$\hat{s}_j^k = \frac{\sum_{i \in j} s^i - s^k + s^C}{N_j}.$$

Faculty H is assumed to be the more successful (e.g. more prestigious, listed higher in rankings or part of some excellence initiative), therefore the average status of faculty H is higher than L:

$$\hat{s}_H = \frac{\sum_{i \in H} s^i}{N_H} > \frac{\sum_{i \in L} s^i}{N_L} = \hat{s}_L.$$

Incumbent professors have a linear, additive utility function which is given by the utility from status of all other faculty members plus special performance benefits distributed in a Tullock contest. This is different to PRÜFER/WALZ (2009) as they divide the budget B equally among all professors with a sharing parameter $\alpha < 1$. In their model, the relative

sigma-algebra generated by the closed interval $[\underline{s}, \bar{s}]$. The realizations s^i describe the status position of a professor in a faculty.

¹³TULLOCK (1980) studied contests of rival rent-seekers expending resources to influence the policy outcome. The contest success function is given by: $p_i(e_1, \dots, e_n) = \frac{e_i^r}{\sum_{j=1}^n e_j^r}$ for $r > 0$ if $\max\{e_1, \dots, e_n\} > 0$ otherwise $p_i(e_1, \dots, e_n) = \frac{1}{n}$. Typically, effort levels invested decide the outcome of the contest. The marginal impact of an increase in the contestant's effort is reflected by r . For $r = 1$ the winning probability equals the share of effort expenditure in the total expenditure (KONRAD (2009)).

¹⁴This awarding procedure is comparable to a merit-points procedure ("Leistungspunkte-Verfahren"), which is modeled as a J-type tournament or a logit-form contest (LÜNSTROTH (2009)).

status does not play any role. The contribution of my paper is the introduction of the contest. It is an important extension as it captures the actual professor's remuneration in Germany with performance-dependent salary component.

Thus, for professor k in faculty j the utility before the appointment of a new professor ("ante") is given by:

$$U_j^k(\text{ante}) = \frac{\sum_{i \in j} s^i - s^k}{N_j - 1} + \frac{s^k}{\sum_{i \in j} s^i} B. \quad (1)$$

After the appointment ("post") of a candidate with status s^C this utility takes the following form:

$$U_j^k(\text{post}) = \frac{\sum_{i \in j} s^i - s^k + s^C}{N_j} + \frac{s^k}{\sum_{i \in j} s^i} (B - W_j). \quad (2)$$

Existing members trade off the utility they receive via the average status of the department (which has spill-over effects e.g. through joint research) against their individual income given by the performance-dependent remuneration. Hiring a very good candidate may increase the research output of the department and consequently the status, but may simultaneously reduce the individual income of incumbents, resulting in relative deprivation. Furthermore, hiring a more successful and therefore more expensive candidate reduces the budget available for special performance benefits. STOLEN/GLEASON (1986) show in their theoretical analysis on time allocation in academe, that reducing the wage-fund pool leads to more rent-seeking activities. These might foster the appointment of a less successful candidate.

A first insight into the selection decision is given by the utility differential of an appointment. It is the difference of the utility of a professor k in faculty j after the appointment of a new candidate (2) minus his utility before the entry (1):

$$\begin{aligned} \Delta_j^k &= U_j^k(\text{post}) - U_j^k(\text{ante}) \\ &= \frac{\sum_{i \in j} s^i - s^k + s^C}{N_j} + \frac{s^k}{\sum_{i \in j} s^i} (B - W_j) - \left(\frac{\sum_{i \in j} s^i - s^k}{N_j - 1} + \frac{s^k}{\sum_{i \in j} s^i} B \right) \\ &= \underbrace{\frac{1}{N_j} (s^C - \hat{s}_j^k)}_{\text{"spill-over"}} - \underbrace{\frac{s^k}{\sum_{i \in j} s^i} W_j}_{\text{"relative deprivation"}} \end{aligned} \quad (3)$$

Here the trade-off a faculty faces when appointing a new professor becomes evident. The first term stands for the spill-over effect: It is the gain from an appointment measured as the equal share of the increase in the average status of the faculty. The effect of relative deprivation is given by the second term: It is the cost an incumbent has to bear

– defined as his forgone earnings – which is his relative share of what is payed to the new professor (his wage W_j).

Details of the following comparative statics results can be found in the appendix.

Comparative statics of the utility differential Δ_j^k :

- The utility differential is strictly increasing in s^C : The higher the status of the candidate, the higher the utility gain of professor k in faculty j from the appointment.
- The utility differential is decreasing in the rank of the professor k within the faculty s^k : The higher the status position of an incumbent, the lower is his personal utility gain from an appointment.
- The utility differential is decreasing in the wage payed to the candidate W_j : The higher the wage, the lower is the personal utility gain from an appointment.
- Finally, the utility differential is decreasing in the number of the professors N_j : The more professors are in a faculty, the lower is the personal utility gain of each researcher from an appointment.

Therefore, the analysis provided is applicable for smaller faculties.

Proposition 3.1 *Utility differential*

Incumbent professors with a higher status position benefit less from an appointment of a candidate than faculty members with a low status rank.

Recall that $s_j^{\bar{n}_j}$ describes the status of the highest ranked faculty member and $s_j^{n_j}$ the status of the lowest ranked. The utility from the average status of the faculty from the point of view of the lowest ranking member is $\hat{s}_j^{n_j}$ which is strictly larger than $\hat{s}_j^{\bar{n}_j}$, as

$$\hat{s}_j^{n_j} = \frac{\sum_{i \in j} s^i - s^{n_j}}{N_j - 1} > \frac{\sum_{i \in j} s^i - s^{\bar{n}_j}}{N_j - 1} = \hat{s}_j^{\bar{n}_j}.$$

For the utility differential of these two extremes follows (see Appendix):

$$\Delta_j^{n_j} > \Delta_j^{\bar{n}_j}.$$

Between the two extreme status positions, the utility differential is monotonous.

The introduction of the trade-off between the spill-over and the effect of relative deprivation results in the utility differential – the return on an appointment – being lower for professors with a high status position in the faculty than for lower ranked members.¹⁵ The intuition is that faculty members with a low status benefit more from joint research than members with high status, as $\hat{s}_j^{n_j} > \hat{s}_j^{\bar{n}_j}$. Furthermore, the relative share of the

¹⁵This results contradicts PRÜFER/WALZ (2009), as they proof: $\Delta_j^{n_j} < \Delta_j^{\bar{n}_j}$.

costs of the appointment is lower for a low status member. The costs of an appointment are greater for a high-ranked professor. The costs might overcompensate the benefits and consequently, the gain from an appointment is smaller for a very successful professor.

Compared with PRÜFER/WALZ (2009), I find that incumbents with high status positions will be more restrictive in appointment decisions requiring higher entry standards for candidates than low status professors. As professors with high status benefit less they need better candidates to compensate this difference. This can be seen as a first hint that the effect of relative deprivation might dominate the spill-over effect in faculty recruiting.

4. The choice under majority voting

The competition for candidates between the two faculties with different status is modeled as a two-stage game. In the first stage, both faculties simultaneously decide on a minimum entrance requirement ($s_{j,\min}^C$ the minimum status level the candidate has to fulfill) and make a take-it-or-leave-it offer for the wage W_j . In the second stage, the candidate joins the faculty which offers him the highest utility. Complete information is assumed throughout both stages.

4.1. The candidate's decision

Before we turn to the two-stage game, we have to introduce the utility function of the candidate C. If a new professor (candidate C) is appointed to the faculty, his utility function is given by the utility from the average status of the faculty plus the wage he receives minus some reservation utility $R \geq 0$ he would receive from an employment outside the university:

$$U_j^C = \frac{\sum_{i \in j} s^i}{N_j} + W_j - R = \hat{s}_j + W_j - R. \quad (4)$$

The newly appointed professor does not receive special performance benefits in the first years after his appointment. Most university guidelines for performance related benefits define a waiting period of three years. Therefore, he does not participate in the contest for special performance benefits directly. Nevertheless, the incumbent professors regard him as a competitor in future tournaments when considering their appointment decision. Backward induction tells us to analyze the final stage of the game first in order to deduce equilibriums in the first stage. Here, in the second stage, the candidate receives a take-it-or-leave-it wage offer from the faculties and he has to decide which one to join. Two conditions have to be considered: the participation and the indifference condition.

First, the candidate has to decide whether to join a faculty at all. He will enter faculty j if his participation constraint (PC) is met: His utility from joining the faculty and receiving a wage W_j minus some reservation utility R he would get from an employment

outside the university must be positive. Hence:

$$\hat{s}_j + W_j - R \geq 0 \quad (5)$$

Secondly, the candidate has to decide which offer to accept: He will enter faculty j if his indifference constraint (IC) is fulfilled, meaning that his utility from joining faculty j must be greater or equal than the one from joining faculty q :

$$\hat{s}_j + W_j \stackrel{(-)}{>} \hat{s}_q + W_q \quad (6)$$

If the indifference condition is fulfilled with equality, we assume that the candidate joins faculty H . Given the behavior of the candidate, it is now possible to derive equilibria in the first stage.

4.2. The faculty's decision

The two faculties $j \in \{H, L\}$ compete for candidates. In the first stage of the game, both faculties choose a minimum status level required for an appointment $s_{j,\min}^C$ and a wage W_j . Under majority voting, the decisive member of the faculty is the person with median status level $s_j^{m_j}$. The decision problem can be written as

$$\begin{aligned} \max_{s_{j,\min}^C; W_j} \quad & \operatorname{argmax}\{\Delta_j^{m_j}, 0\} & (7) \\ (PC) \quad & \hat{s}_j + W_j - R \geq 0 \\ (IC) \quad & \hat{s}_j + W_j \stackrel{(-)}{>} \hat{s}_q + W_q & (8) \end{aligned}$$

The median member of the faculty maximizes the utility differential he receives from an appointment of a new professor subject to the candidate's willingness to join the faculty j (Participation constraint (5)) and his indifference condition (6), stating that he will join the faculty that offers him the highest utility.

A first step in analyzing the allocation of candidates is to look at the minimum status requirements for an appointment by solving $\Delta_j^{m_j} = 0$ for s^C .

$$\begin{aligned} \Delta_j^{m_j} &= \frac{1}{N_j} (s^C - \hat{s}_j^{m_j}) - \frac{s^{m_j}}{\sum_{i \in j} s^i} W_j \stackrel{!}{=} 0 \\ \Leftrightarrow \quad s_{j,\min}^C &= \hat{s}_j^{m_j} + N_j \frac{s^{m_j}}{\sum_{i \in j} s^i} W_j & (9) \end{aligned}$$

For faculty L follows:

$$s_{L,\min}^C = \hat{s}_L^{m_L} + N_L \frac{s^{m_L}}{\sum_{i \in L} s^i} W_L \quad (10)$$

A candidate joins faculty H , if the indifference condition is met with equality. Using this assumption, we can rearrange the (IC) to $W_H = W_L - (\hat{s}_H - \hat{s}_L)$ and substitute the expression for W_H :

$$\begin{aligned}
s_{H,\min}^C &= \hat{s}_H^{m_H} + N_H \frac{s^{m_H}}{\sum_{i \in H} s^i} W_H \\
&= \hat{s}_H^{m_H} + N_H \frac{s^{m_H}}{\sum_{i \in H} s^i} [W_L - (\hat{s}_H - \hat{s}_L)] \\
&= \hat{s}_H^{m_H} - N_H \frac{s^{m_H}}{\sum_{i \in H} s^i} (\hat{s}_H - \hat{s}_L) + N_H \frac{s^{m_H}}{\sum_{i \in H} s^i} W_L \\
&= \hat{s}_H^{m_H} - N_H \frac{s^{m_H}}{\sum_{i \in H} s^i} (\hat{s}_H - \hat{s}_L - W_L)
\end{aligned} \tag{11}$$

We know from the comparative statics that the utility differential $\Delta_j^{m_j}$ is strictly increasing in s^C . Consequently, a faculty j will not appoint candidates with a status below this entrance requirement, $s^C < s_{j,\min}^C$.

The difference between the two status levels indicates which faculty is more exclusive when appointing new candidates:

$$\begin{aligned}
s_{H,\min}^C - s_{L,\min}^C &= \hat{s}_H^{m_H} - N_H \frac{s^{m_H}}{\sum_{i \in H} s^i} (\hat{s}_H - \hat{s}_L) + N_H \frac{s^{m_H}}{\sum_{i \in H} s^i} W_L - (\hat{s}_L^{m_L} + N_L \frac{s^{m_L}}{\sum_{i \in L} s^i} W_L) \\
&= \hat{s}_H^{m_H} - \hat{s}_L^{m_L} - N_H \frac{s^{m_H}}{\sum_{i \in H} s^i} (\hat{s}_H - \hat{s}_L) + W_L (N_H \frac{s^{m_H}}{\sum_{i \in H} s^i} - N_L \frac{s^{m_L}}{\sum_{i \in L} s^i})
\end{aligned}$$

Let $\alpha_1 = N_H \frac{s^{m_H}}{\sum_{i \in H} s^i}$ and $\alpha_2 = N_L \frac{s^{m_L}}{\sum_{i \in L} s^i}$.

Then the difference of minimum status level for the entrance simplifies to:

$$s_{H,\min}^C - s_{L,\min}^C = \hat{s}_H^{m_H} - \hat{s}_L^{m_L} - \alpha_1 (\hat{s}_H - \hat{s}_L) + W_L (\alpha_1 - \alpha_2). \tag{12}$$

This term is positive, iff

$$\alpha_1 < \frac{\hat{s}_H^{m_H} - \hat{s}_L^{m_L} - \alpha_2 W_L}{(\hat{s}_H - \hat{s}_L) - W_L} =: \tilde{\alpha}$$

Consequently, the more exclusive faculty H also requires a higher status level from a candidate than faculty L would.¹⁶

¹⁶The case that faculty L demands higher entry standards ($\alpha_1 > \tilde{\alpha}$) is excluded from the analysis.

Proposition 4.1 *Minimum status requirements*

As long as $\alpha_1 < \tilde{\alpha}$, the more exclusive faculty H appoints candidates with a relatively higher status compared to faculty L . The minimum status requirement in H is strictly larger than in L , as $s_{H,\min}^C > s_{L,\min}^C$.

This relation is not independent from the wage offered by faculty L , thus, we have a look at the connection:

$$\begin{aligned} & s_{H,\min}^C - s_{L,\min}^C > 0 \\ \Leftrightarrow & W_L > \frac{\hat{s}_L^{m_L} - \hat{s}_H^{m_H} + \frac{s^{m_H}}{\hat{s}_H}(\hat{s}_H - \hat{s}_L)}{\frac{s^{m_H}}{\hat{s}_H} - \frac{s^{m_L}}{\hat{s}_L}} \\ \Leftrightarrow & W_L > \frac{\hat{s}_L^{m_L} - \hat{s}_H^{m_H} + \alpha_1(\hat{s}_H - \hat{s}_L)}{\alpha_1 - \alpha_2} \end{aligned}$$

Both minimum status requirements from faculty H and L depend on the wage faculty L is willing to offer. Consequently, this wage W_L is a strategic tool when competing for candidates. One faculty makes an offer and the other faculty determines the entrance status $s_{j,\min}^C$ as its best response.

Implicit differentiation $\frac{ds_{j,\min}^C}{ds^k}$ shows that the higher the status of an incumbent professor k , the higher is his minimum entrance requirement for the candidate:

$$\frac{ds_{j,\min}^C}{ds^k} = -\frac{\frac{\partial \Delta_j^k}{\partial s^k}}{\frac{\partial \Delta_j^k}{\partial s_{j,\min}^C}} = N_j \frac{\sum_{i \in j} s^i - s^k}{(\sum_{i \in j} s^i)^2} W_j > 0$$

Members with high status need a relatively higher entrance requirement to compensate their loss because of relative deprivation. They have to pay a larger part of the candidate's wage in contrast to professors with a lower status. Again, this is contrary to PRÜFER/WALZ (2009), as they show $\frac{ds_{j,\min}^C}{ds^k} < 0$.

Wage levels and minimum entrance requirements

From the minimum status requirement and the (PC) and (IC) different wage levels can be deduced:

Solving the participation constraint (PC) for W_L gives the minimum salary faculty L has to pay when exploiting the candidate completely:

$$W_L^E = R - \hat{s}_L. \tag{13}$$

Substituting this wage level W_L^E into the minimum entrance requirement $s_{j,\min}^C$ yields:

$$s_{L,\min}^C(W_L^E) = \hat{s}_L^{m_L} + \alpha_2 W_L^E = \hat{s}_L^{m_L} + \alpha_2(R - \hat{s}_L), \tag{14}$$

$$s_{H,\min}^C(W_L^E) = \hat{s}_H^{m_H} + \alpha_1 W_L^E = \hat{s}_H^{m_H} + \alpha_1(R - \hat{s}_H). \tag{15}$$

If faculty H would offer candidates with status $s^C > s_{H,\min}^C$ the wage W_L^E as well, faculty L consequently would have an incentive to raise their wage offer in order to secure the appointment of the candidate. Solving $s_{H,\min}^C$ for W_L leads to the minimal competitive salary

$$W_L^+ = \hat{s}_H - \hat{s}_L + \frac{1}{\alpha_1}(s^C - \hat{s}_H^{m_H}) + \varepsilon. \quad (16)$$

with $\varepsilon > 0$, but sufficiently small.

Finally, if the competition between the faculties becomes very intense, faculty L is willing to offer the entire budget as the wage of the candidate. Rearranging the indifference constraint (IC), faculty H has to pay

$$\tilde{W}_H = B - (\hat{s}_H - \hat{s}_L), \quad (17)$$

if faculty L uses the entire budget B for the candidate's wage. The corresponding minimum entrance status is given by

$$s_{H,\min}^C(W_L = B) = \hat{s}_H^{m_H} - \alpha_1(\hat{s}_H - \hat{s}_L - B). \quad (18)$$

Proposition 4.2 *Equilibrium with majority voting*

The subgame-perfect equilibrium can be characterized with the following wage levels and minimum status requirements in four regions:

- i) The losing faculty offers a wage as competitive as possible with $\Delta_j^{m_j} = 0$.
- ii) Region IV: A candidate with very low status $s^C < s_{L,\min}^C(W_L^E) = \hat{s}_L^{m_L} + \alpha_2(R - \hat{s}_L)$ does not get any offer from either faculty.
- iii) Region III: A candidate with medium status $s^C \in [s_{L,\min}^C(W_L^E), s_{H,\min}^C(W_L^E))$ only gets an offer from faculty L .
The candidate joins L with a wage $W_L = W_L^E = R - \hat{s}_L$.
- iv) Region II: A candidate with medium status $s^C \in [s_{H,\min}^C(W_L^E), s_{H,\min}^C(W_L = B))$ receives offers from both faculties.
He joins faculty L with $W_L = W_L^+ = \hat{s}_H - \hat{s}_L + \frac{1}{\alpha_1}(s^C - \hat{s}_H^{m_H}) + \varepsilon$.
- v) Region I: A candidate with status $s^C \geq s_{H,\min}^C(W_L = B)$ receives offers from both faculties. He joins faculty H with $W_H = \tilde{W}_H = B - (\hat{s}_H - \hat{s}_L)$.

Figure 1 visualizes this result which is equivalent to the result by PRÜFER/WALZ (2009) but with slightly different wage levels and regions.¹⁷

The faculty which loses the competition and does not appoint a new professor behaves as competitive as possible with $\Delta_j^{m_j} = 0$. There is no incentive to bid a higher or lower wage as this would violate the minimum status entrance requirement and render the

¹⁷In order to ensure that $\tilde{W}_H > W_L^E$, we assume that $\hat{s}_H < 2\hat{s}_H + L - R$.

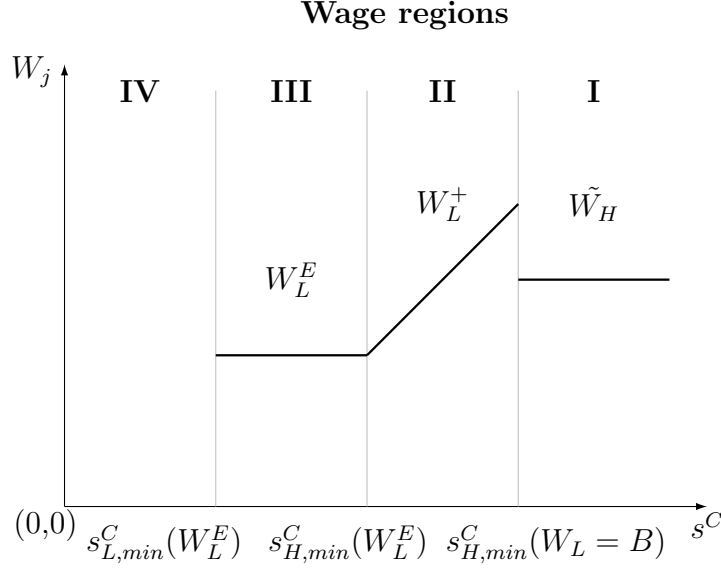


Figure 1: Minimum status requirements and wages (adapted from PRÜFER/WALZ (2009))

utility differential of the decisive median member negative. Taking this behavior into account, the derived wage levels of the winning faculty are its best responses.

In region IV, applying professors are not very qualified and have a very low status position. As $s_{H,\min}^C > s_{L,\min}^C$, the lowest entry standard is given by faculty L . W_L^E is the wage offered by faculty L , wherefore the participation constraint of the candidate becomes binding. With $\frac{\partial s_{L,\min}^C}{\partial W_L} > 0$, the minimum entrance requirement is increasing in the wage offered by faculty L and therefore, $s_{L,\min}^C(W_L^E)$ is the lowest possible entry status for which faculty L makes an offer. Candidates with status $s^C < s_{L,\min}^C(W_L^E)$ are not accepted by faculty L (nor by H). The utility differential of the median member would be negative, if he appointed a candidate with such a low status.

In region III, faculty H is not able to accept a candidate with status level $s^C < s_{H,\min}^C(W_L^E)$. The candidate would accept an offer as his (PC) and (IC) are fulfilled, but the utility gain of the median member in faculty H from appointing such a candidate is negative.

$$\begin{aligned}
\Delta_H^{m_H}(W_L^E) &= \frac{1}{N_H}(s^C - \hat{s}_H^{m_H}) - \frac{s^{m_H}}{\sum_{i \in H} s^i} W_L^E & (19) \\
&= \frac{1}{N_H}(\hat{s}_H^{m_H} + \alpha_1(R - \hat{s}_H) - \hat{s}_H^{m_H}) - \frac{s^{m_H}}{\sum_{i \in H} s^i}(R - \hat{s}_L) \\
&= \frac{s^{m_H}}{\sum_{i \in H} s^i}(R - \hat{s}_H) - \frac{s^{m_H}}{\sum_{i \in H} s^i}(R - \hat{s}_L) = \frac{s^{m_H}}{\sum_{i \in H} s^i}(\hat{s}_L - \hat{s}_H) < 0
\end{aligned}$$

As faculty H can not submit an acceptable offer to the candidate, faculty L can exploit this situation and just offer candidates with $s^C \in [s_{L,\min}^C(W_L^E), s_{H,\min}^C(W_L^E))$ the minimal possible wage W_L^E .

In region II, the two faculties compete for the candidates with status level $s^C \geq s_{H,\min}^C(W_L^E)$. As the status requirement of H depends on the wage offered by faculty L , L has the possibility to choose a wage W_L^+ which makes the candidate join faculty L . By this, they can ensure that $s_{H,\min}^C(W_L) > s^C > s_{L,\min}^C(W_L)$. Therefore, faculty H does not accept the candidate. The higher s^C , the higher is the offered wage as $\frac{\partial W_L^+}{\partial s^C} = \frac{1}{\alpha_1} > 0$. The highest wage faculty L is able to pay is the whole budget B . Consequently, the upper bound of this region is given by $s_{H,\min}^C(W = B) = \hat{s}_H^{m_H} + \alpha_1(\hat{s}_H - \hat{s}_L - B)$. Here the candidate receives a wage that nearly exhausts faculty L 's budget.

Finally in region I, faculty L has spent its whole budget. Faculty H can therefore make an attractive offer to candidates with status $s^C \geq s_{H,\min}^C(W = B)$. As the participation constraint holds for all $s^C \geq s_{L,\min}^C(W_L^E)$, faculty H just has to ensure that the indifference condition is fulfilled with equality. From this, the wage \tilde{W}_H is derived as the difference of the budget B and the status differences between the faculties.

4.3. The allocation of surplus

In order to analyze the impact of the different minimum entrance status and wage levels on the recruitment decision, one has to compare the allocation of surplus between the faculty, the faculty member with median status position and the candidate.

Recall that the surplus of the candidate is given by his utility from joining a university minus his outside option

$$\Delta_C = U_j^C = \hat{s}_j + W_j - R, \quad (20)$$

while the utility difference of the median status member is given by

$$\Delta_j^{m_j} = \frac{1}{N_j}(s^C - \hat{s}_j^k) - \frac{s^k}{\sum_{i \in j} s^i} W_j. \quad (21)$$

The surplus of the faculty Δ_j is the total gain from the appointment of a new professor, the aggregated utility differentials of all incumbents k of a faculty:

$$\Delta_j = \sum_k \Delta_j^k = \sum_k \left(\frac{1}{N_j} (s^C - \hat{s}_j^k) - \frac{s^k}{\sum_{i \in j} s^i} W_j \right) = s^C - \hat{s}_j - W_j. \quad (22)$$

Region IV

In region IV, no entry takes place as the candidate's status does not fulfill the requirements of either faculty. Therefore, the surplus of the all three parties is zero:

$$\Delta_j^{m_j} = \Delta_j = \Delta_C = 0.$$

Region III

In region III, a candidate with status $s^C \in [s_{L,\min}^C(W_L^E), s_{H,\min}^C(W_L^E)]$ joins faculty L with a wage $W_L = W_L^E = R - \hat{s}_L$. Consequently, the utility differential of the median member and the whole faculty H is $\Delta_H^{m_H} = \Delta_H = 0$, as no appointment takes place there.

The candidate enjoys an utility gain of $\Delta_C(W_L^E) = \hat{s}_L + W_L^E - R = 0$. Faculty L has the power to exploit the candidate totally, as H would not be willing to accept the candidate due to his low status. Thus, the participation constraint (PC) of the candidate becomes binding.

For the median member in faculty L follows that

$$\Delta_L^{m_L} = \Delta_L^{m_L}(W_L^E) = \frac{1}{N_L} (s^C - \hat{s}_L^{m_L}) - \frac{s^{m_L}}{\sum_{i \in L} s^i} W_L^E = \frac{1}{N_L} (s^C - \hat{s}_L^{m_L}) - \frac{s^{m_L}}{\sum_{i \in L} s^i} (R - \hat{s}_L). \quad (23)$$

Rearranging $s_{L,\min}^C(W_L^E) = \hat{s}_L^{m_L} + \alpha_2(R - \hat{s}_L)$ to $\hat{s}_L^{m_L} = s_{L,\min}^C(W_L^E) - \alpha_2(R - \hat{s}_L)$ and substituting into $\Delta_L^{m_L}(W_L^E)$ yields:

$$\begin{aligned} \Delta_L^{m_L}(s_{L,\min}^C(W_L^E)) &= \frac{1}{N_L} (s^C - s_{L,\min}^C(W_L^E) + \alpha_2(R - \hat{s}_L)) - \frac{s^{m_L}}{\sum_{i \in L} s^i} (R - \hat{s}_L) \\ &= \frac{1}{N_L} (s^C - s_{L,\min}^C(W_L^E)). \end{aligned} \quad (24)$$

The lower bound of the utility gain for the professor with median status in faculty L is at $s^C = s_{L,\min}^C(W_L^E)$ with $\Delta_L^{m_L}(s_{L,\min}^C(W_L^E)) = 0$. If $s^C > s_{L,\min}^C(W_L^E)$, then $\Delta_L^{m_L}(W_L^E)$ increases in the status of the candidate, as

$$\frac{\partial \Delta_L^{m_L}(W_L^E)}{\partial s^C} = \frac{1}{N_L} s^C > 0.$$

Finally, the aggregate utility gain (or surplus) of faculty L sums up to

$$\Delta_L(W_L^E) = s^C - \hat{s}_L - W_L^E = s^C - R.$$

Substituting $s_{L,\min}^C(W_L^E) = \hat{s}_L^{m_L} + \alpha_2(R - \hat{s}_L)$ into Δ_L gives the lower bound of this expression:

$$\begin{aligned} \Delta_L(s_{L,\min}^C(W_L^E)) &= \hat{s}_L^{m_L} + \alpha_2(R - \hat{s}_L) - R & (25) \\ &= \hat{s}_L^{m_L} + N_L \frac{s^{m_L}}{\sum_{i \in L} s^i} (R - \hat{s}_L) - R \\ &= \hat{s}_L^{m_L} - N_L \frac{s^{m_L}}{\sum_{i \in L} s^i} \hat{s}_L + R \left(N_L \frac{s^{m_L}}{\sum_{i \in L} s^i} - 1 \right) \\ &= \hat{s}_L^{m_L} - s^{m_L} + R \left(N_L \frac{s^{m_L}}{\sum_{i \in L} s^i} - 1 \right) \\ &= \hat{s}_L^{m_L} - s^{m_L} + R \left(\frac{s^{m_L}}{\hat{s}_L} - 1 \right) \end{aligned}$$

Depending on the distribution of faculty's status, this expression is either positive or negative.

$$\Delta_L(s_{L,\min}^C(W_L^E)) = \underbrace{\hat{s}_L^{m_L} - s^{m_L}}_{(+)} + R \underbrace{\left(\frac{s^{m_L}}{\hat{s}_L} - 1 \right)}_{(++)} \quad (26)$$

From $(+) > 0 \Leftrightarrow \hat{s}_L^{m_L} > s^{m_L}$ it follows that $\hat{s}_L > s^{m_L}$ and $(++) < 0$. And vice versa, $(+) < 0 \Leftrightarrow \hat{s}_L^{m_L} < s^{m_L}$ gives $\hat{s}_L < s^{m_L}$ and $(++) > 0$. Therefore, the sign of the expression depends on the relation of \hat{s}_L and $\hat{s}_L^{m_L}$:

$$\begin{aligned} \hat{s}_L - \hat{s}_L^{m_L} &= \frac{\sum_{i \in L} s^i}{N_L} - \frac{\sum_{i \in L} s^i - s^{m_L}}{N_L - 1} & (27) \\ &= \frac{\sum_{i \in L} s^i (N_L - 1) - N_L (\sum_{i \in L} s^i - s^{m_L})}{N_L (N_L - 1)} \\ &= \frac{N_L s^{m_L} - \sum_{i \in L} s^i}{N_L (N_L - 1)} = \frac{s^{m_L} - \hat{s}_L}{N_L - 1} \end{aligned}$$

If the average status of the faculty \hat{s}_L is greater (smaller) than the median status s^{m_L} , this difference is negative (positive).¹⁸ If $\hat{s}_L - \hat{s}_L^{m_L} > 0$, then $s^{m_L} > \hat{s}_L > \hat{s}_L^{m_L}$ which is the case for (most) negatively skewed distributions¹⁹. Vice versa, if $\hat{s}_L - \hat{s}_L^{m_L} < 0$, then

¹⁸The skewness of a random variable S is the third standardized moment: $\gamma_1 = E\left[\left(\frac{S-\mu}{\sigma}\right)^3\right]$. If $\gamma_1 > 0$ the distribution is positively skewed, $\gamma_1 < 0$ it is negatively skewed.

¹⁹One example is the geometric distribution.

$s^{m_L} < \hat{s}_L < \hat{s}_L^{m_L}$ which is the case for (most) positively skewed distributions²⁰. Returning to the aggregate surplus of faculty L

$$\Delta_L(s_{L,\min}^C(W_L^E)) = \underbrace{\hat{s}_L^{m_L} - s^{m_L}}_{(+)} + R \underbrace{\left(\frac{s^{m_L}}{\hat{s}_L} - 1\right)}_{(++)}, \quad (28)$$

one can conclude:

- *Positively skewed distributions:*

A positive skewness in the status distribution occurs if there are many incumbent professors with low status levels and only few members of the faculty with high status. Then:

(+) > 0, whereas (++) < 0. As $\hat{s}_L < \hat{s}_L^{m_L}$, the second term (++) together with a sufficiently small R does not outweigh the first term (+). Consequently, the utility gain of the total faculty when appointing a candidate who just fulfills the minimum status requirement is positive ($\Delta_L(s_{L,\min}^C(W_L^E)) > 0$).

- *Negatively skewed distributions:*

If there are many incumbents at the upper end of the status distribution and very few less qualified members, the status distribution is likely to be negatively skewed. Then:

(+) < 0, whereas (++) > 0. As $\hat{s}_L > \hat{s}_L^{m_L}$ and $|(+)| > |(++)|$, the second term (++) in combination with a sufficiently small R does not outweigh the first term (+). Consequently, the utility gain of the total faculty when appointing a candidate who just fulfills the minimum status requirement is negative ($\Delta_L(s_{L,\min}^C(W_L^E)) < 0$).

In both cases a sufficiently small R satisfies the following relation. Otherwise, the sign of the overall surplus changes.

$$\frac{\hat{s}_L}{R} > \frac{\hat{s}_L - s^{m_L}}{\hat{s}_L^{m_L} - s^{m_L}}.$$

The connection between the skewness of the status distribution and the sign of the aggregate utility gain will be of importance in the other two regions as well. The implications for the recruiting decision will be discussed at the end of this section.

Region II

We now turn to region II, in which a candidate with status

$s^C \in [s_{H,\min}^C(W_L^E), s_{H,\min}^C(W_L = B))$ joins faculty L at a wage

$W_L^+ = \hat{s}_H - \hat{s}_L + \frac{1}{\alpha_1}(s^C - \hat{s}_H^{m_H}) + \varepsilon$. As faculty H does not get a new professor, the utility gain is zero ($\Delta_H = \Delta_H^{m_H} = 0$). Differing from region III, the candidate enjoys a positive surplus as well:

$$\Delta_C(W_L^+) = \hat{s}_L + W_L^+ - R = \hat{s}_H + \frac{1}{\alpha_1}(s^C - \hat{s}_H^{m_H}) + \varepsilon - R \quad (29)$$

²⁰Examples are: log-normal, Gamma, Weibull and Exponential distribution.

A candidate who just fulfills the minimum entrance requirements

$s_{H,\min}^C(W_L^E) = \hat{s}_H^{m_H} + \alpha_1(R - \hat{s}_H)$ gives the lower bound:

$$\Delta_C(s_{H,\min}^C(W_L^E); W_L^+) = \hat{s}_H + \frac{1}{\alpha_1}(\hat{s}_H^{m_H} + \alpha_1(R - \hat{s}_H) - \hat{s}_H^{m_H}) + \varepsilon - R = \varepsilon > 0. \quad (30)$$

For $s^C > s_{H,\min}^C(W_L^E)$, the utility gain from an appointment is increasing in the status of the candidate, as

$$\frac{\partial \Delta_C(W_L^+)}{\partial s^C} = \frac{1}{\alpha_1} > 0.$$

The professor with median status position in faculty L receives a surplus of

$$\begin{aligned} \Delta_L^{m_L}(W_L^+) &= \frac{1}{N_L}(s^C - \hat{s}_L^{m_L}) - \frac{s^{m_L}}{\sum_{i \in L} s^i} W_L^+ & (31) \\ &= \frac{1}{N_L}(s^C - \hat{s}_L^{m_L}) - \frac{s^{m_L}}{\sum_{i \in L} s^i} (\hat{s}_H - \hat{s}_L + \frac{1}{\alpha_1}(s^C - \hat{s}_H^{m_H}) + \varepsilon) \\ &= \frac{1}{N_L} s^C - \frac{1}{N_L} \hat{s}_L^{m_L} - \frac{s^{m_L}}{\sum_{i \in L} s^i} (\hat{s}_H - \hat{s}_L) - \frac{\frac{s^{m_L}}{\sum_{i \in L} s^i}}{N_H \frac{s^{m_H}}{\sum_{i \in H} s^i}} s^C + \frac{\frac{s^{m_L}}{\sum_{i \in L} s^i}}{N_H \frac{s^{m_H}}{\sum_{i \in H} s^i}} \hat{s}_H^{m_H} - \frac{s^{m_L}}{\sum_{i \in L} s^i} \varepsilon \\ &= s^C \left(\frac{1}{N_L} - \frac{\frac{s^{m_L}}{\sum_{i \in L} s^i}}{N_H \frac{s^{m_H}}{\sum_{i \in H} s^i}} \right) + \left(\frac{\frac{s^{m_L}}{\sum_{i \in L} s^i}}{N_H \frac{s^{m_H}}{\sum_{i \in H} s^i}} \hat{s}_H^{m_H} - \frac{1}{N_L} \hat{s}_L^{m_L} \right) - \frac{s^{m_L}}{\sum_{i \in L} s^i} (\hat{s}_H - \hat{s}_L) - \frac{s^{m_L}}{\sum_{i \in L} s^i} \varepsilon \end{aligned}$$

As in the other regions, the surplus of the median member is zero if he admits a candidate with lower bound status level. For higher status levels the utility differential is increasing in the status of the candidate:

$$\begin{aligned} \frac{\partial \Delta_L^{m_L}(W_L^+)}{\partial s^C} &= \frac{1}{N_L} - \frac{\frac{s^{m_L}}{\sum_{i \in L} s^i}}{N_H \frac{s^{m_H}}{\sum_{i \in H} s^i}} > 0 \\ \Leftrightarrow N_H \frac{\frac{s^{m_H}}{\sum_{i \in H} s^i}}{\frac{s^{m_L}}{\sum_{i \in L} s^i}} &> N_L \Leftrightarrow N_H \frac{s^{m_H}}{\sum_{i \in H} s^i} > N_L \frac{s^{m_L}}{\sum_{i \in L} s^i} \end{aligned}$$

This equation holds for $N_H \geq N_L$ as faculty H is the more exclusive one with higher status levels and $\frac{s^{m_H}}{\sum_{i \in H} s^i} > \frac{s^{m_L}}{\sum_{i \in L} s^i}$.

The aggregate utility gain of faculty L is given by:

$$\begin{aligned}\Delta_L(W_L^+) &= s^C - \hat{s}_L - W_L^+ = s^C - \hat{s}_L - (\hat{s}_H - \hat{s}_L + \frac{1}{\alpha_1}(s^C - \hat{s}_H^{mH}) + \varepsilon) \\ &= s^C - \hat{s}_H - \frac{1}{\alpha_1}(s^C - \hat{s}_H^{mH}) - \varepsilon = s^C(1 - \frac{1}{\alpha_1}) - \hat{s}_H + \frac{1}{\alpha_1}\hat{s}_H^{mH} - \varepsilon.\end{aligned}\quad (32)$$

How much does the faculty gain, if she admits a candidate right at the bottom line of the required entrance standard? Substituting $s^C = s_{H,\min}(W_L^E) = \hat{s}_H^{mH} + \alpha_1(R - \hat{s}_H)$ into $\Delta_L(W_L^+)$ gives

$$\begin{aligned}\Delta_L(s_{H,\min}^C(W_L^E); W_L^+) &= (\hat{s}_H^{mH} + \alpha_1(R - \hat{s}_H))(1 - \frac{1}{\alpha_1}) - \hat{s}_H + \frac{1}{\alpha_1}\hat{s}_H^{mH} - \varepsilon \\ &= \hat{s}_H^{mH} + \alpha_1(R - \hat{s}_H) - (R - \hat{s}_H) - \hat{s}_H - \varepsilon \\ &= \hat{s}_H^{mH} + \alpha_1(R - \hat{s}_H) - R - \varepsilon \\ &= \hat{s}_H^{mH} - s_H^{mH} + R(\alpha_1 - 1) - \varepsilon \\ &= \underbrace{\hat{s}_H^{mH} - s_H^{mH}}_{(*)} + R \underbrace{(\frac{s_H^{mH}}{\hat{s}_H} - 1)}_{(**)} - \varepsilon\end{aligned}\quad (33)$$

Again as in region III, depending on the distribution of the status in the faculty, the aggregate surplus of the faculty is either positive or negative.

- *Positively skewed distributions:*

$(*) > 0$, whereas $(**) < 0$. As $\hat{s}_H < \hat{s}_H^{mH}$, the second term $(**)$ together with R and $\varepsilon > 0$ sufficiently small does not outweigh the first term $(*)$. Consequently, the utility gain of the total faculty when appointing a candidate who just fulfills the minimum status requirement is positive ($\Delta_L(s_{H,\min}^C(W_L^E); W_L^+) > 0$).

- *Negatively skewed distributions:*

$(*) < 0$, whereas $(**) > 0$. As $\hat{s}_H > \hat{s}_H^{mH}$, the second term $(**)$ together with a sufficiently small R and a small ε does not outweigh the first term $(*)$. Consequently, the utility gain of the total faculty when appointing a candidate who just fulfills the minimum status requirement is negative ($\Delta_L(s_{H,\min}^C(W_L^E); W_L^+) < 0$).

In both cases a sufficiently small R is given by satisfying the following relation. Otherwise, the sign changes and the interpretation is the other way round.

$$\frac{\hat{s}_H}{R + \varepsilon} > \frac{\hat{s}_H - s_H^{mH}}{\hat{s}_H^{mH} - s_H^{mH}}.$$

Region I

Finally, the allocation of surplus in region I has to be analyzed. Here, a candidate with $s^C \geq s_{H,\min}^C(W_L = B)$ receives offers from both faculties, but he joins faculty H for $W_H = \tilde{W}_H = B - (\hat{s}_H - \hat{s}_L)$. Faculty H is not successful in the competition for candidates, therefore the surplus of the median member and the overall surplus are zero,

$$\Delta_L = \Delta_L^{mL} = 0.$$

Hence, the candidate receives a utility of

$$\Delta_C(\tilde{W}_H) = \hat{s}_H + \tilde{W}_H - R = \hat{s}_H + (B - (\hat{s}_H - \hat{s}_L)) - R = B + \hat{s}_L - R. \quad (34)$$

This is independent from s^C and $\frac{\partial \Delta_C}{\partial s^C} = 0$ is constant. For a sufficiently small R , the utility gain of the candidate is positive, as $\Delta_C(\tilde{W}_H) > 0 \Leftrightarrow B + \hat{s}_L > R$.

Next, the utility differential of the professor with median status in faculty H is discussed:

$$\Delta_H^{mH}(\tilde{W}_H) = \frac{1}{N_H}(s^C - \hat{s}_H^{mH}) - \sum_{i \in H} \frac{s^{mH}}{s^i} \tilde{W}_H = \frac{1}{N_H}(s^C - \hat{s}_H^{mH}) - \sum_{i \in H} \frac{s^{mH}}{s^i} (B - (\hat{s}_H - \hat{s}_L)). \quad (35)$$

At the lower bound of the candidate's entry requirement

$s^C = s_{H,\min}^C(W_L = B) = \hat{s}_H^{mH} - \alpha_1(\hat{s}_H - \hat{s}_L - B)$, this expression is zero:

$$\Delta_H^{mH}(s_{H,\min}(W_L = B), \tilde{W}_H) = 0.$$

But it is increasing in the candidate's status s^C as $\frac{\partial \Delta_H^{mH}}{\partial s^C} = \frac{1}{N_H} > 0$.

Now, the aggregate surplus of the faculty can be determined:

$$\Delta_H(\tilde{W}_H) = s^C - \hat{s}_H - \tilde{W}_H = s^C - \hat{s}_H - (B - (\hat{s}_H - \hat{s}_L)) = s^C - \hat{s}_L - B \quad (36)$$

Taking the lowest possible entry standard, substituting it into $\Delta_H(s_{H,\min}^C(W_L = B), \tilde{W}_H)$ and rearranging, yields

$$\begin{aligned} \Delta_H(s_{H,\min}^C(W_L = B), \tilde{W}_H) &= \hat{s}_H^{mH} - \alpha_1(\hat{s}_A - \hat{s}_L - B) - \hat{s}_L - B \\ &= \hat{s}_H^{mH} - s^{mH} + (\alpha_1 - 1)(\hat{s}_L + B) \\ &= \underbrace{\hat{s}_H^{mH} - s^{mH}}_{(\circ)} + \underbrace{(\hat{s}_L + B)\left(\frac{s^{mH}}{\hat{s}_H} - 1\right)}_{(\circ\circ)}. \end{aligned} \quad (37)$$

Again as in the previous regions, depending on the distribution of the status in the faculty, the aggregate surplus of the faculty is either positive or negative:

- *Positively skewed distributions:*

(\circ) > 0 , whereas ($\circ\circ$) < 0 . As $\hat{s}_H < \hat{s}_H^{mH}$, the second term ($\circ\circ$) together with a sufficiently small $\hat{s}_L + B$ does not outweigh the first term (\circ). Consequently, the utility gain of the total faculty when appointing a candidate who just fulfills the minimum status requirement is positive ($\Delta_H(s_{H,\min}(W_L = B), \tilde{W}_H) > 0$).

- *Negatively skewed distributions:*

(\circ) < 0 , whereas ($\circ\circ$) > 0 . As $\hat{s}_H > \hat{s}_H^{mH}$, the second term ($\circ\circ$) together with a sufficiently small $\hat{s}_L + B$ does not outweigh the first term (\circ). Consequently, the utility gain of the total faculty when appointing a candidate who just fulfills the minimum status requirement is negative ($\Delta_H(s_{H,\min}(W_L = B), \tilde{W}_H) < 0$).

In both cases a sufficiently small $\hat{s}_L + B$ is given by satisfying the following relation.

Otherwise, the sign of the total utility gain changes.

$$\frac{\hat{s}_H}{\hat{s}_L + B} > \frac{\hat{s}_H - s^{m_H}}{\hat{s}_H^{m_H} - s^{m_H}}.$$

Table 1 summarizes the results.

Region	IV	III	II	I
Candidate	0	0	$\Delta_C(W_L^+) \geq 0$ $\frac{\partial \Delta_C(W_L^+)}{\partial s^C} > 0$	$\Delta_C(\tilde{W}_H) \geq 0$ $\frac{\partial \Delta_C(\tilde{W}_H)}{\partial s^C} = 0$
Faculty H	0	0	0	$\Delta_H^{m_H}(\tilde{W}_H) \geq 0$ $\frac{\partial \Delta_H^{m_H}(\tilde{W}_H)}{\partial s^C} > 0$
Faculty L	0	$\Delta_L^{m_L}(W_L^E) \geq 0$ $\frac{\partial \Delta_L^{m_L}(W_L^E)}{\partial s^C} > 0$	$\Delta_L^{m_L}(W_L^+) \geq 0$ $\frac{\partial \Delta_L^{m_L}(W_L^+)}{\partial s^C} > 0$	0
Aggregate surplus winning faculty	0	$\Delta_L(W_L^E) > 0 \Leftrightarrow$ $\hat{s}_L^{m_L} > s^{m_L}$ $\frac{\partial \Delta_L(W_L^E)}{\partial s^C} > 0$	$\Delta_L(W_L^+) > 0 \Leftrightarrow$ $\hat{s}_H^{m_H} > s^{m_H}$ $\frac{\partial \Delta_L(W_L^+)}{\partial s^C} > 0$	$\Delta_H(\tilde{W}_H) > 0 \Leftrightarrow$ $\hat{s}_H^{m_H} > s^{m_H}$ $\frac{\partial \Delta_H(\tilde{W}_H)}{\partial s^C} > 0$

Table 1: Surplus Division

In order to decide whether the faculty has come to a good decision when appointing a new candidate, we compare the surplus of the median member $\Delta_j^{m_j}$ to the aggregate surplus of the faculty Δ_j . If the faculty admits a candidate with a status which just equals the minimum status requirement (lower bound of the region), the utility gain of the median member is zero (by construction).

The aggregate surplus of the winning faculty $j \in \{H, L\}$ is given by

$$\Delta_j = \hat{s}_j^{m_j} - s^{m_j} + \xi \quad (38)$$

with

$$\xi = \begin{cases} R\left(\frac{s^{m_L}}{\hat{s}_L} - 1\right), & \text{in region II,} \\ R\left(\frac{s^{m_H}}{\hat{s}_H} - 1\right) - \varepsilon, & \text{in region III,} \\ (\hat{s}_L + B)\left(\frac{s^{m_H}}{\hat{s}_H} - 1\right), & \text{in region IV.} \end{cases}$$

On the one hand, if the distribution is positively skewed, Δ_j is positive. On the aggregate level, it then would have been beneficial to lower $s_{j,\min}^C$ and admit a candidate with marginally lower status paying the equilibrium wage of the respective region. The

median member has been too restrictive when deciding on whom to choose. This results in an underinvestment into new professors and the professor with median status levels enjoys a positive externality.

A positive skewness of the status distribution in the faculty emerges, if there are many incumbent professors with low status position and very few members with high positions. The professor with median status level (which is relatively low) is too restrictive. He is searching for a "superstar", although an ordinary candidate would be far more beneficial for the faculty as a whole. This results indicates that the spill-over effect dominates the effect of relative deprivation for this constellation of incumbent faculty members.

On the other hand, if the distribution is negatively skewed, the aggregate surplus of the winning faculty is negative. A candidate with a status level equal to the lower bound of the region is admitted to the faculty as the median member derives zero utility gain. But from the faculty's point of view, it would have been better not to appoint the candidate for the respective equilibrium wage and raise the minimum entrance requirement $s_{j,\min}^C$. In this case, overinvestment in new faculty takes place and the median member puts a negative externality on the entire faculty.

A faculty with a lot of very high qualified, high status members and just a few low status members is represented by a negatively skewed status distribution. The median member is too liberal when appointing new professors. He lets candidates join with a relatively low status position. In this case, the effect of relative deprivation seems to dominate the decision. The good professors do not care much about the possibility for joint research, as they already have good colleagues to work with. They want to avoid having to pay a high salary as this reduces their own utility gain from an appointment. In the long run, this admission strategy might result in a the average status of the faculty to deteriorate over time. This presumption is strengthened by SOBEL (2000), who analyzes a model in which relative standing determines the passing level or entrance standards. He shows that those standards are likely to decline.

5. Conclusion

Are appointment committees searching for the best? This question can not be answered with one "yes" or "no". As I have shown, it depends on many factors. Using a model of clubs and their admission decision, I analyzed the appointment decision of university faculty. This paper extends the baseline model of PRÜFER/WALZ (2009) as it incorporates the actual remuneration of professors in Germany: It allows for special performance benefits awarded in a contest.

Using the utility differential of an appointment, I show that professors with a low status benefit more from an appointment than existing members of the faculty with high status. The higher the status of a candidate, the higher the gain from an appointment for the individual.

If we look at the gain of the faculty in total these results change a little: In faculties

with many low status professors and very few high status members, the appointment committee is too restrictive. They set too high entry standards. This result indicates that the spill-over effect might dominate the effect of relative deprivation. For the low status professors it is very important to raise the overall reputation of the faculty. They might hope that the increase in reputation might result in a higher departmental budget and eventually in a salary rise.

At the other extreme, we find a faculty with very few low status members and lots of highly successful professors. For such a faculty, increasing the overall reputation is not that important as it already is quite renowned. Here the effect of relative deprivation seems to dominate the appointment decision. The faculty chooses candidates with a low status position as they have to pay them a lower salary. Thus, the costs of appointment are lower and the risk to end in an inferior position in the upcoming contests is minimized. Therefore, faculties with highly-ranked candidates require lower entrance standards.

In the long run, this appointment strategy results in the status of a department oscillating around the median. This might lead to a higher conformity of universities and their departments. As WEBER (1919) feared, mediocrity is still prevalent in today's institutions governing academia.

It is hard to break through such deadlocked structures. One attempt is currently taken by the university of Lüneburg where the university appointed 40 new professors with the help of an external appointment committee. Professors from the university itself had no say in the decisions (SIMON (2010)). §26(3) of the law for institutions of higher education in Lower Saxony ("Niedersächsisches Hochschulgesetz" (NHG)) states: If a department shall be restructured in order to advance the development of the university or to assure the quality, the university governance can staff an appointment committee exclusively with external professors and other equally qualified persons.²¹ According to one member of the governance board of the university of Lüneburg the reason to take this approach was the wish to notably increase the quality of the departments in question.

These insights imply that the reform of the professor's remuneration in Germany may have severe consequences for the appointment of new faculty members. One possible remedy is to render the procedures of an appointment and the criteria of the committees more specific and more explicit, for example by explicitly calculating the average status of the faculty as a minimum appointment standard.

It may be worthwhile to test the conclusions of the proposed model in an experimental setting. Testable hypotheses are:

H1: Professors with a high status position gain less from an appointment than lower ranked faculty members.

²¹"Wenn eine Fakultät aus Gründen der Hochschulentwicklung oder zur Qualitätssicherung insgesamt oder in einem wesentlichen Teil grundlegend neu strukturiert werden soll, so kann das Präsidium nach Anhörung des Senats und im Einvernehmen mit dem Fachministerium oder dem Stiftungsrat beschließen, dass hierfür die Berufungskommission (...) ausschließlich mit externen Professorinnen und Professoren sowie mit gleichermaßen geeigneten Personen besetzt werden kann."

H2: Faculties with a positively skewed status distribution are too restrictive when appointing new professors.

H3: Faculties with a negatively skewed status distribution are too liberal when appointing new professors.

Other areas of application outside academia cover the recruitment decisions of partnerships (e.g. consulting, lawyers, doctors) and the appointment of lawyers to higher courts in Germany.

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A. Utility differential

$$\begin{aligned}
\Delta_j^k &= U_j^k(\text{post}) - U_j^k(\text{ante}) \\
&= \frac{\sum_{i \in j} s^i - s^k + s^C}{N_j} + \frac{s^k}{\sum_{i \in j} s^i} (B - W_j) - \left(\frac{\sum_{i \in j} s^i - s^k}{N_j - 1} + \frac{s^k}{\sum_{i \in j} s^i} B \right) \\
&= \frac{\sum_{i \in j} s^i - s^k + s^C}{N_j} - \frac{\sum_{i \in j} s^i - s^k}{N_j - 1} - \frac{s^k}{\sum_{i \in j} s^i} W_j \\
&= \frac{(N_j - 1)(\sum_{i \in j} s^i - s^k + s^C) - N_j(\sum_{i \in j} s^i - s^k)}{N_j(N_j - 1)} - \frac{s^k}{\sum_{i \in j} s^i} W_j \\
&= \frac{N_j s^C - \sum_{i \in j} s^i + s^k - s^C}{N_j(N_j - 1)} - \frac{s^k}{\sum_{i \in j} s^i} W_j \\
&= \frac{-\sum_{i \in j} s^i + s^k - s^C + N_j s^C}{N_j(N_j - 1)} - \frac{s^k}{\sum_{i \in j} s^i} W_j \\
&= \frac{-\sum_{i \in j} s^i + s^k}{N_j(N_j - 1)} - \frac{s^C(1 - N_j)}{N_j(N_j - 1)} - \frac{s^k}{\sum_{i \in j} s^i} W_j \\
&= -\frac{1}{N_j} \frac{\sum_{i \in j} s^i - s^k}{N_j - 1} - \frac{s^C(1 - N_j)}{N_j(N_j - 1)} - \frac{s^k}{\sum_{i \in j} s^i} W_j \\
&= -\frac{1}{N_j} \hat{s}_j^k + \frac{s^C(N_j - 1)}{N_j(N_j - 1)} - \frac{s^k}{\sum_{i \in j} s^i} W_j = \frac{1}{N_j} (s^C - \hat{s}_j^k) - \frac{s^k}{\sum_{i \in j} s^i} W_j
\end{aligned}$$

The utility differential is strictly increasing in s^C :

$$\frac{\partial \Delta_j^k}{\partial s^C} = \frac{1}{N_j} > 0$$

The utility differential is strictly decreasing in s^k :

$$\frac{\partial \Delta_j^k}{\partial s^k} = -\frac{\sum_{i \in j} s^i - s^k}{(\sum_{i \in j} s^i)^2} W_j < 0$$

The utility differential is strictly decreasing in W_j :

$$\frac{\partial \Delta_j^k}{\partial W_j} = -\frac{s^k}{\sum_{i \in j} s^i} < 0$$

The utility differential is strictly decreasing in N_j :

$$\frac{\partial \Delta_j^k}{\partial N_j} = -\frac{s^C}{N_j^2} - \frac{(\sum_{i \in j} s^i - s^k)(2N_j - 1)}{N_j^2(N_j - 1)^2} < 0$$

This equation holds for

$$s^C > \frac{(\sum_{i \in j} s^i - s^k)(2N_j - 1)}{(N_j - 1)^2} = \hat{s}_j^k \frac{2N_j - 1}{N_j - 1}$$

Proof of 3.1:

How does the utility differential behave for the two extremes with $s^{\bar{n}_j} > s^{n_j}$?

$$\begin{aligned} \Delta_j^{\bar{n}_j} &= \frac{1}{N_j}(s^C - \hat{s}_j^{\bar{n}_j}) - \frac{s^{\bar{n}_j}}{\sum_{i \in j} s^i} W_j = \frac{1}{N_j} \left(s^C - \frac{\sum_{i \in j} s^i - s^{\bar{n}_j}}{N_j - 1} \right) - \frac{s^{\bar{n}_j}}{\sum_{i \in j} s^i} W_j \\ &= \frac{1}{N_j} \left(s^C - \frac{\sum_{i \in j} s^i}{N_j - 1} \right) - s^{\bar{n}_j} \underbrace{\left[\frac{1}{\sum_{i \in j} s^i} W_j - \frac{1}{N_j(N_j - 1)} \right]}_{>0, \text{ if } W_j > \frac{\sum_{i \in j} s^i}{N_j(N_j - 1)} = \frac{\hat{s}_j}{N_j - 1}} \end{aligned}$$

$$\begin{aligned} \Delta_j^{n_j} &= \frac{1}{N_j} \left(s^C - \frac{\sum_{i \in j} s^i}{N_j - 1} \right) - s^{n_j} \underbrace{\left[\frac{1}{\sum_{i \in j} s^i} W_j - \frac{1}{N_j(N_j - 1)} \right]}_{>0, \text{ if } W_j > \frac{\sum_{i \in j} s^i}{N_j(N_j - 1)} = \frac{\hat{s}_j}{N_j - 1}} \end{aligned}$$

As $s^{\bar{n}_j} > s^{n_j}$, it follows that: $\Delta_j^{\bar{n}_j} < \Delta_j^{n_j}$.