Pre-Analysis Plan: Willingness-to-Pay for Attributes of High-Profile Jobs*

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Contents

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1 Introduction

1.1 Abstract

In this pre-analysis plan, we describe a choice experiment that induces exogenous variation in the attributes of high-profile jobs. We focus on a specific type of high-profile job, namely tenured professorships, and aim at identifying the willingness to pay for certain job attributes among highly educated workers who actually hold this type of job, or will likely negotiate about a tenured professorship in the near future. The key features of the experimental design follow Maestas et al. [2018]. The job attributes we study include performance-related pay, the option to negotiate about further pay increases, and mobility requirements. Special attention will be given to gender differences in the willingness-to-pay for (avoiding) these attributes.

1.2 Motivation

This pre-analysis plan refers to an online choice experiment that allows us to elicit workers' preferences over jobs under exogenous variation in job attributes. Our main contribution relative to previous studies using similar approaches is that we focus on high-profile job offers. A key feature of our design is that we sample workers who actually hold this type of job, or will likely negotiate about a high-profile job offer in the near future. In order to do so, we focus on an important segment of the market of high-profile jobs, namely the market for tenured professorships. In collaboration with the association of professors in Germany (Deutscher Hochschulverband, DHV), we plan to collect data in a sample of high-profile workers. The population of workers to be invited to the survey consists of active associate and full professors (most of them tenured) and (non-tenured) assistant professors, many of whom will likely negotiate about a job offer for a tenured professorship in the near future. The experimental design aims at identifying the willingness-to-pay (WTP) for certain job attributes. The job attributes we study include performance-related pay, the option to negotiate about further pay increases, and mobility requirements (plus other job attributes discussed in the following). Special attention will be given to gender differences in the willingness-to-pay for (avoiding) these attributes.

In many aspects, our experimental design follows Maestas et al. [2018], who use a survey experiment to estimate the WTP of workers for alternative work

arrangements and various non-wage characteristics of job offers. The approach is based on the idea of inducing random variation in fictitious job profiles and observing the choices individuals make when facing the tradeoff between these hypothetical job offers with different wage and non-wage characteristics. The resulting data allow us to identify the workers' average willingness to pay for the presence of certain job characteristics.

2 Institutional Background

The academic job market in Germany offers favorable conditions for implementing our experimental design. In the following, we briefly describe the basic features of the institutional setting. We focus on features related to the monetary compensation of professors.

We aim at eliciting the WTP for attributes of tenured professorships. Because our sample comprises tenured as well as non-tenured professors in Germany, we describe in the following how the monetary compensation of these workers is set.

Non-tenured academic positions in Germany include various forms of postdoc positions and assistant professorships, so-called junior professorships. Individuals holding a non-tenured position typically receive a fixed pay that is not performance-dependent. Our experiment is concerned with preferences over tenured positions. These positions come at two levels of base pay, called "W2" and "W3". We focus on W3 positions (highest level of base pay). The monthly base pay for these positions is set by the federal states. For newly hired professors, the base pay varies (depending on the state) between €6483 and €7790. Five years after tenure, the base pay ranges between €6728 and €7790. In the experiment, we leverage the fact that on top of their base pay, candidates for professorships can negotiate with the university about a bonus, called "Berufungsleistungsbezug". Bonus levels vary a lot, with mean monthly levels in the range between €800 (social sciences) and €1550 (engineering, economics and business).[1] Importantly, the bonus can be fixed (or permanent), or performance-dependent. If both parties agree on a performance-dependent bonus, a common way of implementation is that the parties define a set of goals to be reached by the candidate within a pre-defined time frame (typically three years). A tempo-

[1] We obtained discipline-specific mean values from experts at DHV who offer counseling services for DHV members when negotiating with universities over job offers.

rary monthly bonus is paid up-front. Only if the goals are met, the temporary bonus becomes permanent. In the experiment, we leverage this feature by varying whether job offers have a performance-dependent or a fixed bonus.

Besides a monthly bonus to be paid immediately, the laws of the federal states also allow candidates and universities to initiate negotiations about a further pay increase ("Besondere Leistungsbezüge") three years after the candidate started on the job, with a common maximum increase by €800. In the experiment, we leverage this feature by varying whether or not a job offer includes the option to negotiate about a further pay increase three years into the job.

3 Experimental Design

3.1 Survey

Before participating in the experiments, each respondent answers a survey about demographics and current job characteristics. We elicit the following:

- current position (Post-Doc, Assistant Professor (W1, no tenure track), Assistant Professor (W1, tenure track), Associate Professor (W2, non-tenured), Associate Professor (W2, tenured), Full Professor (W3, non-tenured), Full Professor (W3, tenured)
- age (if tenured: <40, 40-49, 50-60, >60; if non-tenured: <35, 35-39, 40-44, >44)
- gender
- children of primary school age, or younger, who need some form of care during workdays (yes/no)
- taking into account private and family situation: flexibility in choosing a place of residence (Likert scale from 1 (very unflexible) to 7 (very flexible))
- current workplace in daily commuting distance from main place of residence (yes/no)
- federal state (current position)
- discipline (social sciences, law, natural sciences, engineering, economics and business, medicine)

- if non-tenured: how well informed about negotiations for a professorship and the topics typically raised in such negotiations (Likert scale from 1 (very poorly) to 7 (very well))
- if non-tenured: with how many people in touch regularly regarding academic career, negotiations, and other related topics (nobody, one person, two people, ..., 5 people, more than 5 people)
- if tenured: performance-related bonus in current position (yes/no)
- if tenured: number of past negotiations for a professorship (1, 2, 3, more than 3)

3.2 Experiment

After the survey, we administer a series of ten stated-preference experiments to each survey respondent. In each of these experiments, survey respondents are asked to select between two job offers, each defined by a partially varying set of non-wage job characteristics and the job's monetary compensation. To minimize the risk of differential perceptions regarding unspecified job characteristics, we instruct respondents to assume that any job attributes not mentioned are identical across offers.

The job offers' monetary compensations comprise two components. The first component is a fixed base pay that is given by the regulations regarding the compensation of tenured professors in the respective federal state. For a given participant, this base pay in the experiment does not vary between job offers and is the same across all 10 experiments. The second component is the bonus. We leverage this bonus to induce random variation in monetary compensations. Using a discipline-specific mean bonus m,[2] the random variation in the bonus is achieved by setting the bonuses of Offer A and Offer B as $\theta_A m$ and $\theta_B m$, respectively, where θ_A and θ_B follow a $N \sim (1, 0.075)$ distribution. We truncate both weights to lie between 0.5 and 1.5 and round the bonus values to full Euro amounts. If (after rounding) θ_A and θ_B take on the same value, we re-draw both weights.

The offers' non-wage characteristics vary freely. We consider the following characteristics:

[2] We implement the following mean bonuses: €800 in social sciences, €1000 in law, €1250 in natural sciences, and €1550 in engineering, economics/business, and medicine. We chose these mean values under the guidance of experts from the DHV.

- Mobility requirements, measured by whether or not the job's location is within commuting distance of the preferred place of residence for the respondent and her family
- Academic reputation, measured by whether or not the university offering the job has the status of an "Exzellenz-Universität" in the German system of higher education
- Child care options, measured by whether or not the university offers guaranteed placement in a child care facility
- Share of women among professors at the university department offering the job (10%, 25%, or 40%)
- Performance-related pay, measured by whether or not the job features a bonus that is contingent on the job holder reaching certain pre-defined goals
- Option to negotiate further pay increases, measured by whether or not there is an option to negotiate about a further bonus after three years

When creating hypothetical Offers A and B, we randomly select two of these non-wage attributes to vary across the two offers (in addition to the monetary compensation, which always varies between offers). Within each of the two randomly selected attributes, we choose corresponding attribute values at random sequentially for both offers without replacement. This makes sure that Offer A and Offer B actually vary in the selected attributes. We adapt the strategy used by Maestas et al. [2018] to limit the number of job pairs in which one of the jobs dominates the other on all varying dimensions.[3] In addition to the 10 choice experiments, we include one further survey question that serves as an attention check. When facing this question, which appears randomly between the fourth and the last choice experiment, respondents are instructed to respond in a specific way (mark two specific options from a choice menu), irrespective of what they believe is the true answer to the respective question. The attention check

[3]To define dominance, we make the following assumptions: within commuting distance of a suitable place of residence $\succ$ not within commuting distance of a suitable place of residence; outstanding reputation $\succ$ no outstanding reputation; child care options $\succ$ no child care options; higher share of female professors $\succ$ lower share of female professors; fixed bonus $\succ$ performance-dependent bonus; option to negotiate about further pay increase $\succ$ no option to negotiate about further pay increase.

question allows us to estimate the share of inattentive participants and test the robustness of our findings with respect to excluding inattentive respondents.

In terms of implementation, in each experiment we display the hypothetical job offers with all characteristics side by side. We instruct respondents to either select "Prefer Offer A," or "Prefer Offer B." Each respondent makes the binary decision between Offer A and Offer B in 10 distinct sequential experiments.

3.3 Sampling

We plan to run the experiments on a sample of high-profile workers, namely active post-docs and assistant, associate, and full professors in Germany. To recruit the subjects, we will collaborate with the DHV. The email invitations to current professors for participating in the survey will be sent at one point in time (possibly with reminders). We aim at drawing a sample of subjects that is broadly representative of the population of professors in Germany. For that purpose, we plan to compare sample characteristics to population characteristics obtained from the German Statistical Agency.

3.4 Exclusions

After data collection, we will restrict the sample to subjects who completed the online survey and the entire experiment, are less than 60 years of age, and belong to the target populations (subjects holding an assistant, associate or full professorship).

We will also exclude from the sample all subjects that provided data that do not pass basic plausibility and quality checks (for instance, due to speeding). Based on responses to the trick question, we will furthermore define "inattentive" subjects (all subjects who do not pass the attention check). We plan to report as main results the findings from the full sample (subject to the exclusions described before), and results excluding inattentive subjects as robustness checks. However, in case we find evidence suggesting that noise induced by inattentive subjects dilutes the WTP estimates in the full sample, we might report the WTP estimates excluding inattentive subjects as main results. In that case, we will report the result for the full sample in an online appendix or online document unrelated to the paper.

As stated before, the subjects will choose between offers A and B in ten consecutive experiments. To insure against the possibility of subjects becoming less

attentive over time, we plan to test if our results change if we exclude from the estimation sample observations that emerge from the last rounds. For that purpose, we will exclude the last rounds in a stepwise manner (exclude observations only from round 10, from rounds 9 and 10, ..., from rounds 6 to 10). In case we find that our main results are stable if we exclude the final rounds, we will summarize the findings from this exercise in the paper, but we do not commit to reporting the different estimates. In case we find that including the final rounds dilutes our estimates of the WTP, we might report the WTP estimates from a restricted sample as main results. In that case, we will report the full-sample results in an online appendix or online document unrelated to the paper, and describe the results from the stepwise process of excluding the final rounds.

Our sample includes subjects working in all academic disciplines, including medicine. As described before, we account for differences in monetary compensation between disciplines by setting discipline-specific mean bonuses. In medicine, the experiments might still not account for all relevant parts of compensation packages. This is due to the fact that professors in medicine sometimes negotiate these packages not only with the respective university, but also the university hospital they are working at. If we find that WTP estimates in medicine are not in line with estimates in other disciplines, we might exclude ex-post observations on professors in medicine.

3.5 Incentives

To increase participation, we will run a lottery among all participants. The prizes will comprise 11 tablet computers worth about €400 that will be financed via third party funds. Additionally, we plan to have as prizes two free webinars by DHV, worth up to €500 each. The latter prizes are contributed by DHV.

In order to participate in the lotteries, subjects have to report their names and email addresses. This information will be collected in a separate survey after the online experiment. To protect the subjects' privacy, we make sure that the identifying information collected in the second survey cannot be linked to the data collected in the experiment, and we inform participants accordingly.

3.6 Planned Sample Size

DHV's mailing list comprises about 23,800 individuals (post-docs, assistant professors, associate professors, and full professors). All individuals on the list will

be invited. However, we lack a benchmark to predict the professors' willingness to participate in online surveys. We, therefore, abstain from providing exact planned sample sizes. However, we are confident that we will be able to collect a sample that will be sufficiently large to allow for precise WTP estimates for our main job attributes (performance-related pay, option to negotiate, and mobility requirements) in the full sample.

3.7 Minimum Detectable Effects

We do not have any baseline data and thus cannot provide minimum detectable effect sizes. However, based on previous literature using similar methods [Maestas et al., 2018; Nagler et al., 2022a,b], we are confident that we will be able to detect relatively small effects.

4 Empirical Analysis

4.1 Estimation Approach

We will estimate the WTP for certain characteristics of job offers following Maestas et al. [2018]. We assume that the binary choices observed reflect a linear indirect utility function

$$V_{ijt} = \alpha + X'_{ijt}\beta + \delta \ln w_{ijt} + \epsilon_{ijt}, \tag{1}$$

where V_{ijt} represents individual i's indirect utility from alternative j and choice pair t. X_{ijt} represents the vector of non-wage job characteristics, and w_{ijt} is the wage rate.[4] Using a logistic specification, we model the probability to select alternative j over alternative k as

$$P(V_{ijt} > V_{ikt}) = \frac{\exp[(X'_{ijt} - X'_{ikt})\beta + \delta(\ln w_{ijt} - \ln w_{ikt})]}{1 + \exp[(X'_{ijt} - X'_{ikt})\beta + \delta(\ln w_{ijt} - \ln w_{ikt})]}. \tag{2}$$

The indifference condition between a job offer not having attribute r at wage w and one that has attribute r and pays $w - WTP^r$ is

$$\delta \ln w = \beta^r + \delta \ln(w - WTP^r), \tag{3}$$

[4] In contrast to previous studies aiming at the WTP for job attributes, we do not consider hours. This is because, in Germany, almost all professorships are full-time positions.

where the willingness-to-pay WTP^r for attributes that enter the indirect utility negatively would be negative. WTP^r is thus given by

$$WTP^r = w\left[1 - e^{\left(-\frac{\beta^r}{\delta}\right)}\right]. \tag{4}$$

4.2 Presentation of Results and Planned Research Reports

General remarks We will present our estimates in terms of $1-e^{\left(-\frac{\beta^r}{\delta}\right)}$, meaning that, if attribute r is added to a job offer, utility-wise this is equivalent (in the case of $WTP^r < 0$) to a $100\left(1-e^{\left(-\frac{\beta^r}{\delta}\right)}\right)$% wage decrease.

Regarding the type of analyses, including robustness checks and complementary analyses, we will follow Maestas et al. [2018], Nagler et al. [2022a], and Nagler et al. [2022b]. In addition to average treatment effects, we plan to analyze heterogeneities in the WTP for job attributes between different groups of participants. Special attention will be given to gender differences in the valuation of different job options. We also plan to analyze whether the WTP for job attributes differs depending on demographic and background characteristics such as age, the presence of children of primary school age or younger in the household, or self-reported flexibility in choosing the place of residence. In addition, we plan to analyze whether the valuation of different job attributes depends on job-related background characteristics such as the size of the academic network, experience regarding job-related negotiations, or the extent to which participants feel well-informed about negotiations for a professorship. Some of these heterogeneities can only be studied in subsamples. Specifically, heterogeneities regarding the size of the academic network and the extent to which participants feel well-informed about negotiations for a professorship can only be considered among non-tenured professors (since we do not elicit these characteristics among tenured professors). Likewise, the heterogeneities with respect to experience regarding job-related negotiations can only be considered among tenured professors (since we do not elicit this characteristic among non-tenured professors). Beyond studying these subsample-specific heterogeneities, we will test if the WTP for the remaining attributes differs between non-tenured and tenured professors. If we find meaningful differences, we may report separate WTP-estimates by subsample. Finally, following Nagler et al. [2022b], we will also consider possible interaction effects between different non-wage job characteristics.

References

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