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## Reservation Wages and Labor Supply

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# Reservation Wages and Labor Supply

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# Reservation Wages and Labor Supply

## Abstract

Survey measures of the reservation wage reflect both the consumption-leisure trade-off and job search concerns (the arrival rate of job offers and the wage distribution). We examine what a survey measure of the reservation wage reveals about labor supply when search concerns are absent. To this end, we combine the reservation wage measure from a large labor market survey with the reservation wage for a one-hour job that we elicit in an online experiment. The two measures show a strong positive association. For unemployed individuals, the experimental reservation wage increases on average by around one Euro for every Euro increase in the survey measure. For employed individuals, the association between the two measures is weaker, but still positive and statistically significant. We show that these results are robust to selection into the experiment, and that demographic variables have a similar influence on both reservation wage measures.

JEL-Codes: C830, C910, J220.

Keywords: reservation wage, labor supply, search, validation of survey measures.

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# 1 Introduction

The reservation wage is defined as the smallest wage at which a worker is willing to accept a job. It determines individual labor market behavior and is a central concept in labor economics. Obtaining measures of the reservation wage is therefore a central issue for empirical research. Table 1 below offers an overview of labor market surveys and administrative data that contain measures of the reservation wage. They typically use a variant of the question: “What is the lowest wage you would be willing to work for?” Such measures are used to study a variety of important public policy questions, for example, the impact of unemployment insurance benefits on labor supply (e.g., Feldstein and Poterba 1984, DellaVigna and Paserman 2005, Le Barbanchon et al. 2019a), the influence of personal characteristics on reservation wages (e.g., Pannenberg 2010, Caliendo et al. 2017), the evolution of reservation wages with the duration of an unemployment spell (Krueger and Mueller 2016), or the dispersion of nonwage job values (Hall and Mueller 2018).

**[Insert Table 1 about here]**

One important aspect of the reservation wage, which received limited attention so far, is that it captures two different trade-offs. In the context of labor supply, the reservation wage indicates how an individual chooses optimally between consumption and leisure. It then equals the marginal rate of substitution between leisure and consumption. In the context of job search, the reservation wage captures how a worker decides between accepting a certain job immediately, or waiting a little longer until (hopefully) a better offer arrives. It then also depends on the distribution of wages and the arrival rate of job offers. Thus, the reservation wage may capture different aspects of an individual’s decision to accept a job.

For illustration, consider the following two examples. In the first example, we have a young professional with little regard for leisure, but skills that are in high demand. She knows that in the (hypothetical) case of unemployment, attractive job offers would arrive quickly. While she may have a low reservation wage in terms of labor supply, she may indicate a relatively high reservation wage that reflects her splendid job market prospects. In the second example, consider an unemployed individual with high regard for leisure and poor job market prospects. He may also indicate a relatively high reservation wage. This time, however, it mainly reflects his high opportunity costs of time spent in a job.

In this paper, we examine what a survey measure of the reservation wage reveals about labor supply, i.e., an individual’s willingness to trade leisure for consumption when search concerns are absent. We first examine a simple job search model in which we formalize our intuition. In this model, an individual’s reservation wage  $w^*$  depends both on her preferences regarding the leisure-consumption trade-off and on her job market prospects as captured by the

arrival rate of job offers as well as the distribution over wages. We consider a heterogeneous population of workers who differ in their preferences and job market prospects. If the arrival rate of job offers is small,  $w^*$  mostly reflects the consumption-leisure trade-off so that it is closely associated with a hypothetical “no-search reservation wage”  $w^{ns}$  that abstracts from search concerns. Thus, the job acceptance decision is mostly about working versus remaining unemployed. In contrast, if the arrival rate of job offers is very large, then differences in  $w^*$  reflect differences in the distribution of wage offers, so that the link between  $w^*$  and  $w^{ns}$  is weak. That is, if an individual gets many offers, the job acceptance decision is about choosing a given offer or one of the next offers.

We test the implications of our model by combining a survey measure of the reservation wage with an experimental reservation wage for a one-hour job. The survey measure originates from the survey “Panel Study of Labor Market and Social Security” (henceforth PASS) conducted by the research institute of the German Federal Employment Agency. This survey contains both a random sample of the German population and a random sample of individuals from the unemployment register of the Federal Employment Statistics. Survey participants from the second sample are long-term unemployed who receive “type II” unemployment benefits.<sup>1</sup> PASS elicits reservation wages for both employed and unemployed individuals through a series of survey questions that are asked in the context of job search.

To obtain a reservation wage measure that abstracts from search concerns, we invited PASS participants to take part in an online experiment in which we offer a one-hour job. The job is to digitalize research documents. It can conveniently be completed from home within seven days after accepting it. To elicit subjects’ reservation wage for this job in an incentive-compatible manner, we apply the Becker-DeGroot-Marschak mechanism, a standard tool in experimental economics to elicit reservation values. Since this job is short-term and a one-time opportunity, job search concerns do not matter for our experimental measure of the reservation wage.

Our empirical analysis shows that, on average, there is a strong and positive association between survey and experimental reservation wage: The experimental reservation wage increases by about 0.50 Euros if the survey measure of the reservation wage increases by one Euro. However, the association of the two reservation wage measures differs significantly between employed and unemployed individuals. For unemployed individuals, there is roughly a one-to-one relationship between survey and experimental reservation wage. In our main specification, a one Euro increase in the survey reservation wage increases the experimental reservation wage by 1.16 Euros. Thus, for long-term unemployed individuals, the survey reservation wage is indeed a good measure for the consumption-leisure trade-off. In contrast, the

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<sup>1</sup>These benefits are a means-tested welfare payments for individuals capable of working. They are paid out when the non-means-tested wage-related “type I” unemployment benefits expire after 6 to 12 months.

association of the two measures is much weaker for employed individuals. In our main specification, the experimental reservation wage increases by 0.37 Euros for every Euro increase in the survey reservation wage; however, in some specifications, this increase becomes small and statistically insignificant.

In line with our predictions, we find that within the group of employed individuals, the relation between survey and experimental reservation wage is stronger for those with worse labor market prospects, as measured by unemployment risk in their occupational group. Importantly, our estimates are robust to different layers of selection into the experiment. Moreover, we show that correlations of both reservation wage measures with observable characteristics have the same direction and are similar in magnitude.

Our results suggest that a survey reservation wage measures different aspects of labor market behavior for employed and (long-term) unemployed individuals. For the latter group, it mainly reflects how individuals trade-off leisure and consumption. For the former group, the survey reservation wage is still informative about labor supply (at least for working one additional hour), but job market prospects matter as well so that the relationship between the two reservation wage measures is not as tight as for unemployed individuals.

This paper is to the best of our knowledge the first that correlates a survey reservation wage and an incentivized measure of the reservation wage. The only other paper that validates a survey reservation wage is Krueger and Mueller (2016). For a sample of unemployed individuals, they show that the job acceptance rate is larger when the offered wage is above the reservation wage than when it is below. Our paper differs in two important aspects. First, the incentivized variable in our study is not job acceptance, but a reservation wage. This allows for a comparison of two very similar measures. Second, our data set contains both employed and unemployed individuals, so that we can test how the job context affects the association between the two reservation wage measures.

The strong association between the experimental and the survey measure also implies that experiments using short-term working opportunities can be used to study behavioral aspects of labor supply. For example, one can study how the design of a job or its description affects subjects' inclination to accept it. Such research could be informative for designing randomized controlled trials with public labor agencies in a cost-effective manner, and for identifying potential behavioral motivations that drive the behavioral response to the intervention.

The rest of the paper is organized as follows. In Section 2, we analyze a simple model of job search and derive testable predictions about the relationship of different types of reservation wages. Section 3 describes the survey and experiment in detail. In Section 4, we present our main results and examine selection into the experiment. Section 5 concludes. The appendix contains the experimental instructions as well as additional robustness checks.

## 2 Conceptual Framework

*The model.* We consider a simple job-search model to study what we can infer from the reservation wage about how workers resolve the consumption-leisure trade-off. We treat the demand side of the labor market as exogenous and only examine the supply side. Let the worker's utility function be given by  $U(C, \theta L)$ , where  $C$  is consumption,  $L$  leisure, and  $\theta$  a preference parameter that captures how important leisure is relative to consumption. This function is twice continuously differentiable and strictly increasing in both arguments. Denote by  $U_C(C, \theta L)$  and  $U_L(C, \theta L)$  the derivative of the utility function with respect to the first and second argument, respectively.

Initially, the worker is unemployed. She potentially gets job offers in periods  $t = 1, 2, \dots$ ; in a given period  $t$ , she gets one job offer with probability  $p$ , and no job offer with probability  $1 - p$ . The job offer in period  $t$  (if there is one) specifies a wage  $w_t$ . If the agent accepts the job, she leaves the job market and earns  $w_t$  in period  $t$  and all subsequent periods  $t + 1, t + 2, \dots$ ; if she rejects, she remains unemployed and the situation recurs in period  $t + 1$ ; the same happens if in period  $t$  she does not get a job offer. As long as the agent is unemployed, she consumes her unemployment benefits  $b > 0$  and enjoys leisure  $\bar{L}$  in each period, so that her flow utility equals  $U(b, \theta \bar{L})$ . After accepting an offer with wage  $w$ , she consumes  $w$  and enjoys leisure  $\bar{L} - L^*$ , so that her flow utility is  $U(w, \theta(\bar{L} - L^*))$ . Each job requires the same number  $L^*$  of working hours.<sup>2</sup> When the worker receives a job offer, the wage is drawn from a distribution  $G_\xi(w)$ . The parameter  $\xi$  denotes the worker's subgroup that determines her offer distribution (we will elaborate on this below). The support of this distribution is an interval  $[w_L(\xi), w_H(\xi)]$  where  $b < w_L(\xi) < w_H(\xi) < \infty$ .  $G_\xi(w)$  has a continuous density  $g_\xi(w)$  that is strictly positive on this interval. Finally, we assume that the worker discounts future utilities with the discount factor  $\delta$ .

*The reservation wage with and without search concerns.* Consider any period  $t$  where the worker gets a job offer with wage  $w_t$ . The worker's total discounted utility from accepting the offer strictly increases in  $w_t$ . In contrast, the worker's total discounted utility from rejecting the offer is independent of  $w_t$ . Therefore, the worker's optimal strategy in period  $t$  is a cut-off strategy where for some value  $w^*$  the worker accepts the offer if and only if  $w_t \geq w^*$ , and rejects it if  $w_t < w^*$ . As long as the worker has not accepted an offer yet, the decision problem is the same in each period. Thus, the cut-off value  $w^*$  is time-independent and unique. This value is the worker's reservation wage.

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<sup>2</sup>Thus, we abstract from the intensive margin of labor supply. The assumption here is that jobs come with a certain required number of working hours that cannot be adjusted by the employee.



We derive the reservation wage. The total discounted utility from accepting wage  $w_t$  equals

$$U^{ac} = \frac{1}{1 - \delta} U(w_t, \theta(\bar{L} - L^*)), \quad (1)$$

while the total utility from rejecting it when the reservation wage equals  $w^*$  is

$$\begin{aligned} U^r &= U(b, \theta\bar{L}) + \delta[1 - p + pG_\xi(w^*)]U^r \\ &\quad + \frac{\delta}{1 - \delta} p(1 - G_\xi(w^*)) \mathbb{E}_{G_\xi}[U(w, \theta(\bar{L} - L^*)) \mid w \geq w^*]. \end{aligned} \quad (2)$$

The reservation wage  $w^*$  then is implicitly defined by the indifference condition

$$\begin{aligned} U(w^*, \theta(\bar{L} - L^*)) &= \frac{1 - \delta}{1 - \delta + \delta p(1 - G_\xi(w^*))} U(b, \theta\bar{L}) \\ &\quad + \frac{\delta p(1 - G_\xi(w^*))}{1 - \delta + \delta p(1 - G_\xi(w^*))} \mathbb{E}_{G_\xi}[U(w, \theta(\bar{L} - L^*)) \mid w \geq w^*]. \end{aligned} \quad (3)$$

Note that the reservation wage depends both on the agent's utility when she remains unemployed,  $U(b, \theta\bar{L})$ , and on her expected utility from accepting a job when she continues searching and only accepts wages above  $w^*$ ,  $\mathbb{E}_{G_\xi}[U(w, \theta(\bar{L} - L^*)) \mid w \geq w^*]$ . These two terms are weighted by a factor that depends on the discount factor  $\delta$  and the probability of getting an offer above the reservation wage,  $p(1 - G_\xi(w^*))$ .

Suppose that the worker rarely gets a job offer so that  $p \approx 0$ . Her reservation wage is then largely determined by the comparison between her flow utility when working and her flow utility when remaining unemployed. We denote by  $w^{ns}(\theta)$  the worker's (hypothetical) reservation wage when  $p = 0$  so that search concerns are absent. In the following, we call it the “no-search reservation wage.” It is implicitly defined by

$$U(w^{ns}(\theta), \theta(\bar{L} - L^*)) = U(b, \theta\bar{L}). \quad (4)$$

Next, consider a worker who gets many job offers so that  $p \approx 1$ . Moreover, assume that this person is patient enough so that  $\delta \approx 1$ . The first-order condition in (3) then implies that the worker's reservation wage is largely determined by the offers that she could get in the labor market (that is, the term in the second line of this equation). Specifically, we have  $w^* \rightarrow w_H(\xi)$  for  $p \rightarrow 1$  and  $\delta \rightarrow 1$ , i.e., the agent waits until she gets an offer that is close to the maximum wage of her subgroup. Note that the flow utility when unemployed (and the preference parameter  $\theta$ ) then has little influence on the agent's reservation wage.

*Heterogeneity.* We examine what we can infer from the reservation wage  $w^*$  about labor supply in a setting where search concerns are absent, as captured by the no-search reservation

wage  $w^{ns}$ . To this end, we consider a heterogeneous population where workers exhibit varying preference parameters  $\theta$  and subgroups  $\xi$ . Subgroups capture the wage distribution for different occupations or productivity levels. Let  $w^*(\theta, \xi)$  be the reservation wage of a worker with preference parameter  $\theta$  and subgroup  $\xi$ . The preference parameter is distributed on the interval  $[\theta_L, \theta_H]$  with  $0 < \theta_L < \theta_H < \infty$ ; the subgroup is distributed on the interval  $[\xi_L, \xi_H]$  with  $0 < \xi_L < \xi_H < \infty$ . Let  $F(\theta, \xi)$  be the joint distribution function where the density  $f(\theta, \xi)$  is strictly positive on its support. The subgroup parametrizes the distribution over wage offers: we have  $w'_L(\xi) = w'_H(\xi) = 1$  and  $g_{\xi'}(w) = g_\xi(w + \xi' - \xi)$  for all  $\xi, \xi'$  with  $\xi < \xi'$ . In words, an increase in  $\xi$  shifts the density over wage offers to the right. We assume that second- and cross-derivatives in the utility function  $U(C, \theta L)$  are small such that  $w^{ns}(\theta)$  strictly increases in  $\theta$  on the interval  $[\theta_L, \theta_H]$ . From implicit differentiation on (4) we then get

$$\frac{dw^{ns}(\theta)}{d\theta} \approx \frac{U_L(w^{ns}(\theta), \theta(\bar{L} - L^*))L^*}{U_C(w^{ns}(\theta), \theta(\bar{L} - L^*))} > 0. \quad (5)$$

Thus, a higher preference for leisure leads to a higher no-search reservation wage. Consider first a group of workers that rarely gets job offers,  $p \approx 0$ . For these workers, subgroup  $\xi$  has a negligible effect on the reservation wage  $w^*(\theta, \xi)$ . Hence, we obtain a close association between the reservation wages with and without search concerns, so that

$$\frac{d\mathbb{E}_F[w^{ns}(\theta) \mid w^*(\theta, \xi) = w^*]}{dw^*} \approx 1. \quad (6)$$

In Figure 1 below, this relationship is represented by the solid gray line. Next, we examine two extreme cases for workers who get many job offers so that  $p \rightarrow 1$  and  $\delta \rightarrow 1$ . First, consider the case with no heterogeneity in the subgroup dimension; all workers have subgroup  $\tilde{\xi}$ . From the first-order condition in (3) we then get that the association between preference parameter  $\theta$  and the reservation wage  $w^*(\theta, \xi)$  is given by

$$\frac{dw^*(\theta, \tilde{\xi})}{d\theta} \approx \frac{1 - \delta}{1 - \delta + \delta p(1 - G_{\tilde{\xi}}(w^*))} \frac{U_L(w^{ns}(\theta), \theta(\bar{L} - L^*))L^*}{U_C(w^{ns}(\theta), \theta(\bar{L} - L^*))}. \quad (7)$$

In combination with (5), we obtain<sup>3</sup>

$$\frac{dw^{ns}(\theta)}{dw^*(\theta, \tilde{\xi})} \approx \left[ \frac{1 - \delta}{1 - \delta + \delta p(1 - G_{\tilde{\xi}}(w^*))} \right]^{-1}. \quad (8)$$

When workers get many offers,  $p \rightarrow 1$  and  $\delta \rightarrow 1$ , they all have roughly the same reservation wage  $w^*(\theta, \tilde{\xi}) = w_H(\tilde{\xi})$ , but differing no-search reservation wages  $w^{ns}(\theta)$ ; see the black vertical

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<sup>3</sup>To get this result, we use that  $w^*$  maximizes the right-hand side of the first-order condition in (3), so that its derivative with respect to  $w^*$  equals zero.

line in Figure 1. Intuitively, when all workers are in the same subgroup, a small variation in the reservation wage  $w^*$  then indicates a large variation in the preference parameter  $\theta$  and hence in labor supply as measured by the no-search reservation wage.

**[Insert Figure 1 about here]**

Second, consider the case where there is some heterogeneity in the subgroup dimension. If workers get many offers,  $p \rightarrow 1$  and  $\delta \rightarrow 1$ , differences in the reservation wage  $w^*(\theta, \xi)$  largely reflect income differences since  $w^*(\theta, \xi) \approx w_H(\xi)$  for each  $\theta, \xi$ . If there is no correlation between subgroup  $\xi$  and preference parameter  $\theta$ , the reservation wage is uninformative about how workers resolve the consumption-leisure trade-off; the average no-search reservation wage is then constant among subgroups, see the horizontal black line in Figure 1.

For intermediate values of  $p$  and  $\delta$ , the informativeness of the reservation wage about the consumption-leisure trade-off typically lies between these two extreme cases. A higher reservation wage may indicate both a higher subgroup  $\xi$  and a higher preference for leisure  $\theta$ . In Figure 1, this association would generate an upward-sloping curve such as the dotted gray line. The slope and location of this line is essentially an empirical question. Therefore, we next consider a data set that allows us to test the relationship between reservation wages and labor supply.

### 3 Survey and Experiment

*Survey.* Our survey data originate from the “Panel Study Labor Market and Social Security”, PASS (DOI: 10.5164/ IAB.FDZD.1806.en.v1). PASS provides a database to study the demographics and labor market behavior of a representative sample of the German population with an over-representation of long-term unemployed welfare recipients (Trappmann et al. 2019). The latter sample is drawn from the unemployment register of the Federal Employment Agency (IAB). PASS is conducted annually by the IAB.

The survey elicits reservation wages in several steps. In the first step, individuals are asked about their wage expectations when searching for a job. For current job-seekers, this question reads as follows.

[Item 1] *Now let us talk about the wage you expect to get when looking for a job. What is realistic: What do you expect to earn as a monthly net wage?* [Answer is X Euros]

For individuals who currently do not search for a job the first sentence in this question ends with “[...] if you were looking for a job.” The next question then indirectly elicits the expected hourly wage.

[Item 2] *Let us talk a bit longer about such a job, where you would earn  $X$  Euros. How many hours a week would you have to work for this amount of money, do you think?* [Answer is hours per week]

After this, two more questions are asked. They elicit the reservation wage.

[Item 3] *Would you also be willing to work for a monthly net wage less than  $X$  Euros?* [Answer is yes/no]

[Item 4] *How much would this lower monthly net wage have to be as a minimum, in order for you to be willing to take the job?* [Answer is  $Y$  Euros]

When the answer to Item 3 is “no”, the reservation wage equals the expected wage  $X$ . When the answer is “yes”, the reservation wage is given by the answer  $Y$  to Item 4. This procedure ensures that participants do not confuse the concepts of an expected wage and a reservation wage. In both cases, the hourly reservation wage is obtained by dividing  $X$  and  $Y$ , respectively, by the monthly number of working hours derived from the answer to Item 2.

*Experimental Design.* We invite PASS subjects to participate in an experiment, in which we offer them a job that takes one hour to complete. Their task in the job is to digitize scanned PDF documents from the medical faculty of the Ludwig-Maximilians University Munich. Subjects can work from home using their own computer. No particular skills or equipment are needed to perform the job. Subjects receive their salary after working on the job for one hour.

We elicit subject’s reservation wage for the job as part of the experiment. To this end, we apply the Becker-DeGroot-Marschak mechanism, which is a standard tool in experimental economics to elicit reservation values (e.g., Bohm et al. 1997). After describing the job, subjects are asked at which wage between 9 and 35 Euros they are willing to work for one hour. The computer then randomly draws a number  $x$  between 9 and 35. If this number  $x$  is (weakly) above the subject’s reservation wage, she is admitted to the job and is paid a wage of  $x$ . Otherwise, the experiment ends. This procedure ensures that each subject has an incentive to indicate the true reservation wage. We also included the option to state that a subject does not want to accept the job even if the wage is 35 Euros.

The experiment contains a treatment variation where we vary the description of a job (i.e., as having either “high” or “low” meaning).<sup>4</sup> In the empirical analysis below, we control for it and show that this variation does not affect our results.

*Research Hypotheses.* According to our conceptual framework, the survey reservation wage is a measure for the reservation wage  $w^*$ , while the experimental reservation wage reflects

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<sup>4</sup>We exploit this treatment variation in a companion paper (Kesternich et al. 2019).

the no-search reservation wage  $w^{ns}$  for a one-hour job. The association between these two reservation wage measures depends on an individual's job context. We derive three predictions from the discussion in Section 2. First, for long-term unemployed individuals, the reservation wage mostly reflects the trade-off between consumption and leisure. Our hypothesis for these individuals thus equals

$$\left. \frac{dw^{ns}}{dw^*} \right|_{\text{unemployed}} \approx 1. \quad (9)$$

Second, for employed individuals the survey reservation wage may reflect both search concerns and the consumption leisure trade-off. Therefore, we expect

$$\left. \frac{dw^{ns}}{dw^*} \right|_{\text{unemployed}} > \left. \frac{dw^{ns}}{dw^*} \right|_{\text{employed}}. \quad (10)$$

Recall from our model that for a population with heterogeneous subgroups the association between  $w^*$  and  $w^{ns}$  should become small when individuals get many job offers so that  $\delta \rightarrow 1$  and  $p \rightarrow 1$ . We can take account of varying job market prospects of employed individuals in our data, by distinguishing individuals' occupations with high and low unemployment risk. Our third hypothesis refers to these two groups.

$$\left. \frac{dw^{ns}}{dw^*} \right|_{\text{unemployed}} > \left. \frac{dw^{ns}}{dw^*} \right|_{\text{e. high-risk}} > \left. \frac{dw^{ns}}{dw^*} \right|_{\text{e. low-risk}}. \quad (11)$$

*Procedures.* The reservation wage from Wave 11 of the PASS survey was elicited between February 2017 and October 2017.<sup>5</sup> The experiment took place between July 2017 and August 2017. It was conducted over the internet and administered by CentERdata, Tilburg University. In the invitation letter, we announced that participants could earn between 9 and 35 Euros. Additionally, all participants would take part in a lottery for 50 gift-vouchers of value 25 Euros each. The invitation letter as well as screen-shots from the experiment are presented in the Appendix.

Upon clicking on the link to our study, subjects first participate in a survey on perseverance and risk preferences before we introduce the job and elicit the reservation wage. When they are admitted to the job, subjects can complete it immediately or at a later stage (by again clicking on the link to our study).

We sent out invitations to 3,731 randomly selected PASS participants. We only invited PASS participants with at least one employment or unemployment spell, whose survey lan-

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<sup>5</sup>Wave 11 is our main sample. We impute missing information on reservation wages in Wave 11 with those from Wave 10.

guage is German, and who agreed to being contacted for research.<sup>6</sup> In total, we recruited 711 PASS subjects, so the response rate was 19 percent; 551 of them entered a reservation wage between 9 and 35 Euros; for 364 of these subjects the randomly drawn wage weakly exceeded the reservation wage. Our analytic sample consists of 631 subjects for whom we observe both the PASS survey reservation wage as well as the experimental reservation wage.<sup>7</sup> Among them 518 individuals (82 percent) are employed and 113 (18 percent) are unemployed. The average earnings in our study were 25.40 Euros for subjects who completed the job, and 4 Euros for those who could not do the job as their reservation wage was above the random number draw (we did not communicate the payment of the 4 Euros beforehand). All payments were made in September 2017.

## 4 Results

Table 2 contains the descriptive statistics of our analytic sample. Among these subjects, 47 percent are male, and the average age is 44 years; 44 percent have obtained a German high school diploma (abitur) or higher education; 39 percent of our subjects are married, the average number of children per respondent is 1.18. The average reservation wage is 11.12 Euros per hour in the PASS survey, and 17.99 Euros for the one-hour job in the experiment.

**[Insert Table 2 about here]**

Column 2 of Table 2 shows the characteristics of the invited PASS participants. Our experimental sample has a slightly higher share of women, is slightly younger, and has fewer unemployed individuals than the full sample. There are also slightly fewer married individuals and a lower number of children per respondent in our experimental sample. The largest difference between the experimental sample and the invited sample is the level of education. The share of high school graduates is almost twice as large in the experimental sample. We will have a closer look at potential selection issues in Subsection 4.2.

### 4.1 Main Results

We first analyze the association between the two reservation wage measures. Since we only offered wages between 9 and 35 Euros, we will take into account that the experimental reservation wage is censored from above and below. The survey reservation wage is not censored,

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<sup>6</sup>We also excluded 703 PASS participants who we contacted before to participate in a pre-test.

<sup>7</sup>Four individuals in our experiment did not consent to the linkage with PASS data.

but answers are later checked for highly unrealistic values by the interviewer. Because of implausibly low values, we excluded the lowest percentile of the survey reservation wage.<sup>8</sup>

The raw correlation between survey and experimental reservation wage is 0.31 (significant at the one percent-level), suggesting that individuals with higher survey reservation wages are also indicating higher reservation wages in the experiment. To further investigate the relationship between the two measures, we first regress the (hourly) survey reservation wage for individual  $i$  on her experimental reservation wage.

$$(\text{rw exp})_i = \beta_0 + \beta_1(\text{rw svy})_i + \varepsilon_i, \quad (12)$$

where  $(\text{rw exp})_i$  is the experimental reservation wage,  $(\text{rw svy})_i$  is the survey reservation wage, and  $\varepsilon_i$  is the error term. The parameter of interest is  $\beta_1$ . It quantifies the association between the two reservation wage measures. In our main specification, we use Ordinary Least Squares (OLS) to estimate Equation 12. In other specifications, we estimate Tobit models to take into account that the dependent variable is censored.

### [Insert Table 3 about here]

Table 3 presents the results from these regressions. In Column (1), we show the results for the OLS estimation of Equation (12) without controls.<sup>9</sup> We observe a highly significant positive association between the experimental and the survey reservation wage. The regression results suggest that, on average, an individual with a survey reservation wage of 9 Euros (i.e., around the legal minimum wage in Germany) would indicate an experimental reservation wage of about 16.88 Euros. From that point, the experimental reservation wage increases on average by 0.49 Euros when the survey reservation wage increases by one Euro. Thus, the survey reservation wage is informative about labor supply for our one-hour job.

In Column (2), we show the results for the Tobit estimation of Equation (12) without controls. Here we take into account that the experimental reservation wage is censored to lie between 9 and 35 Euros. In this regression, the association with the latent (thus uncensored) experimental reservation wage is 0.74. Thus, an increase in the one measure by one Euro even more closely corresponds to a 1:1 increase in the other when taking account of censoring. In a log-log specification, Column (3), we find that the experimental reservation wage increases by 0.37 percent when the survey wage increases by one percent.

Next, we investigate whether the association between the survey and the experimental reservation wage is stronger for unemployed individuals than for employed individuals. We

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<sup>8</sup>This does not affect any of our experimental participants and is thus only relevant for the comparisons to the full PASS sample.

<sup>9</sup>Note that we always control for the meaning variation from the experiment which we would like to keep constant. It is not shown in the table since it is not central for our results.

hypothesized that when answering to the reservation wage question, the trade-off between leisure and consumption is more relevant for unemployed than for employed individuals. Hence, the association between the two reservation wage measures is expected to be stronger for the former group. We include employment status and an interaction between employment status and survey reservation wage as additional control variables in our baseline regression,

$$(rw\ exp)_i = \beta_0 + \beta_1(rw\ svy)_i + \beta_2unemployed_i + \beta_3((rw\ svy) \times unemployed)_i + \varepsilon_i. \quad (13)$$

Column (4) in Table 3 shows the results of this regression. We observe substantial differences between employed and unemployed individuals. An employed individual with a survey reservation wage of 9 Euros would indicate an experimental reservation wage of about 17.42 Euros. From there, a one Euro increase in the survey reservation wage increases the experimental reservation wage by 0.37 Euros. In contrast, an unemployed individual with a survey reservation wage of 9 Euros would indicate an experimental reservation wage of about 16.04 Euros; a one Euro increase in the survey reservation wage then increases the experimental reservation wage by 1.16 Euros. Thus, the association between the two reservation wage measures is indeed stronger for unemployed individuals. To illustrate these results, Figure 2 presents the predicted experimental reservation wage obtained from the survey reservation wage for employed and unemployed individuals. Observe that the predicted experimental reservation wage for unemployed individuals is almost parallel to the 45-degree line, suggesting that the survey reservation wage for these subjects on average reflects the same consumption-leisure trade-off as for our one-hour job.

Column (5) in Table 3 presents the estimated coefficients of the main and interaction terms obtained from a Tobit regression. As in Column (2) the coefficients are larger when censoring in the experimental reservation wage is taken into account. Besides, these estimates corroborate the results in Column (4), showing that the association between both measures of reservation wage is significantly stronger for unemployed than for employed individuals.

**[Insert Figure 2 about here]**

Our main interpretation of these results is that a positive association between the two reservation wage measures indicates that the survey reservation wage reflects an individual's inclination to substitute leisure for consumption. There may, however, be other reasons that cause a positive relationship. For employed individuals, a higher reservation wage may be related to high income (or many hours of work) and therefore to a low willingness to further trade leisure for consumption. To control for such confounding factors, we re-estimate our main models including a standard set of controls that is usually included in reservation wage regressions (gender, age, marital status, education, number of children). In addition, we include net



income and hours worked to control for the fact that the consumption-leisure trade-off for our one-hour-job may differ depending on hours worked and income earned.

Table 4 shows the results. Including these controls is particularly interesting when considering differences between employed and unemployed individuals; see Columns (4) and (5). We find that the differences between employed and unemployed individuals become even more pronounced when adding controls. While the curvature in the relationship between survey and experimental reservation wage remains close to 1 for unemployed individuals, it becomes small and insignificant for employed individuals.

**[Insert Table 4 about here]**

Finally, we test the implication of our model that the association between the two reservation wage measures increases in unemployment risk. To this end, we use occupation-specific unemployment rates provided in Statistik der Bundesagentur für Arbeit (2019) and classify individuals by whether they are working in occupations with high or low unemployment risk.<sup>10</sup> We consider our baseline regression with a dummy for high employment risk as additional control variable, and an interaction between the high risk dummy and survey reservation wage,

$$(rw \text{ exp})_i = \beta_0 + \beta_1(rw \text{ svy})_i + \beta_2(\text{high risk})_i + \beta_3((rw \text{ svy}) \times (\text{high risk}))_i + \varepsilon_i. \quad (14)$$

Columns (1) and (3) in Table 5 show the results from OLS, while Columns (2) and (4) present the results from the Tobit model. In Column (1), we see that an individual working in a low unemployment risk occupation with a survey reservation wage of 9 Euros would indicate an experimental reservation wage of about 17.10 Euros. From there, a one Euro increase in the survey reservation wage increases the experimental reservation wage by 0.30 Euros. In contrast, an individual working in a high unemployment risk occupation with a survey reservation wage of 9 Euros would indicate an experimental reservation wage of about 17.42 Euros; a one Euro increase in the survey reservation wage then increases the experimental reservation wage by 0.81 Euros; Figure 3 illustrates these results. As suggested by our model, there is a stronger association between the two reservation wage measures among individuals working in occupations with high unemployment risk.

**[Insert Table 5 and Figure 3 about here]**

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<sup>10</sup>Risk for unemployment is calculated from a median-split on unemployment rates for different occupational groups based on the German classification of occupations (KldB 2010) and publicly available data on occupation-specific unemployment rates from the Federal Employment Agency (Bundesagentur für Arbeit, 2010). The median split is performed for 1-digit occupation groups, the results are robust to a 3-digit occupation median split, albeit not statistically significant.

## 4.2 Selection into the experiment

One possible concern for the generalizability of our results is the extent to which we can draw inference about the population from an experiment with a selected sample of participants (e.g., Harrison et al. 2002, von Gaudecker et al. 2011). The PASS survey is conducted with a representative sample of employed and unemployed individuals. In the following analysis, we examine whether selection is a concern for our main results. Our basic sample are 7,577 PASS participants (see the experimental procedures in Section 3 for our selection criteria). We randomly sent out invitations to 3,731 subjects, and recruited 711 PASS participants. In Table 2, we report as full sample the 5,652 PASS participants from the basic sample with non-missing values in all variables that we use in our regressions.

Our sampling procedure induces two potential layers of selection. First, selection between our full sample and our experimental subjects, and second, selection between the sample of invited subjects and experimental subjects. To investigate potential non-random selection, we compare the survey reservation wages for all three samples. As shown in Table 2, our experimental subjects report the highest reservation wage (11.12 Euros).<sup>11</sup> The full sample excluding the experimental subjects has a slightly lower average reservation wage (9.96 Euros). Those who were not invited to participate in the experiment report the lowest average survey reservation wage (9.58 Euros). These numbers suggest that subjects with higher reservation wages are more likely to select into the invited sample as well as into the sample of experimental subjects.

**[Insert Table 6 about here]**

To account for potential non-random selection, we first re-estimate our main equations (12) and (13) using a Heckman two-stage selection model. The first stage estimates the decision to participate in the experiment; the second stage estimates the reservation wage equation taking potential sample selection into account. As exclusion restriction, we use the availability of a subject's e-mail address in addition to their postal address.

The lower panel of Table 6 shows the estimated coefficients for the selection equation. The survey reservation wage is positively associated with the probability of participation in all specifications. This indicates that individuals with higher survey reservation wages are more likely to participate in the experiment. This is in line with the descriptive statistics in Table 2 showing that survey reservation wages are highest in our subject pool. As shown in Columns (2) and (4) of Table 6, an individual's labor force status does not play a significant role for participation in the experiment.

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<sup>11</sup>The average survey reservation wage among experimental subjects who also indicated an experimental reservation wage is 10.76 Euros.

The upper panel of Table 6 displays the estimated coefficients from the outcome equation. The coefficient of the survey reservation wage in Columns (1) and (2) differs only slightly, and is almost identical to the estimated OLS coefficient in Column (1) in Table 3. This also holds for specifications with interaction terms: The coefficients for main and interaction terms differ only slightly across columns; they are very close to the estimated coefficients obtained from OLS, see Column (4) in Table 3. In all specifications, we obtain a negative albeit statistically insignificant inverse Mills ratio. Overall, we conclude that selection into the experiment due to the sampling procedure does not bias our main results.

While the results in Table 6 suggest that our main specification is robust to selection, a disadvantage of the Heckman model is that it relies on strong parametric assumptions which makes it prone to misspecification. To strengthen the robustness of our results, we apply an inverse probability weighting (IPW) as an alternative approach for the two layers of selection.<sup>12</sup> For both, the full sample and the invited sample, we estimate the individual probability of being selected into the experiment, using unemployment indicator, the survey reservation wage (and its interactions) and all covariates as predictors. We then weight each individual by the inverse of these probabilities and estimate our main specification (equation 12 and controls) on the selected sample.<sup>13</sup> The results of the IPW analysis can be found in Table A1 in the Appendix. As for the results obtained from the Heckman model, the estimated coefficients only slightly differ across the two samples. We also find only marginal differences between the estimated main and interaction effects in Table A1 and our main results in Table 3 (and Table 4, respectively). This suggests that our results are robust to potential sample selection.

### 4.3 Determinants of reservation wages

The literature has identified a number of demographic variables that have a robust effect on survey measures of the reservation wage. Men typically have higher reservation wages than women, and reservation wages increase in age as well as education; see, for example, Koenig et al. (2016) or Le Barbanchon et al. (2019a). The same correlations can be found in our PASS sample. In this subsection, we investigate to what extent they also hold for our experimental reservation wage, and whether demographic variables affect the experimental and the survey reservation wage in similar manner. We specify a seemingly unrelated regression (SUR) model comprising two individual equations, one for the survey reservation wage and one for the experimental reservation wage. They are linked through the correlation of their errors. The error

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<sup>12</sup>The IPW is based on the assumption that individual information that can predict the probability of inclusion (non-missingness) are available for the entire study population, so that, after taking account of them, we can make inferences about the entire target population starting from the non-missing observations alone.

<sup>13</sup>For better comparison we also conduct the IPW analysis without controls.

correlation could be caused by unobserved factors that influence both measures of reservation wages.

$$(\text{rw exp})_i = \beta_0 + \mathbf{x}'_{i1}\boldsymbol{\beta} + \varepsilon_{i1} \quad (15)$$

$$(\text{rw svy})_i = \gamma_0 + \mathbf{x}'_{i2}\boldsymbol{\gamma} + \varepsilon_{i2}, \quad (16)$$

where  $\mathbf{x}_{i1}$  and  $\mathbf{x}_{i2}$  are  $(k \times 1)$  vectors containing the same set of covariates. The  $(k \times 1)$  parameter vectors  $\boldsymbol{\beta}$  and  $\boldsymbol{\gamma}$  represent the coefficients of these covariates in Equations (15) and (16), respectively. For a given individual  $i$ , the error terms may be correlated across equations, with  $\mathbb{E}(\varepsilon_{i1}\varepsilon_{i2}|\mathbf{x}_i) = \sigma_{12}$ .

While separate equation-by-equation estimation by OLS provides consistent estimates for  $\boldsymbol{\beta}$  and  $\boldsymbol{\gamma}$ , estimating Equations 15 and 16 jointly has a number of advantages. First, a non-zero error correlation between these two equations,  $\sigma_{12} \neq 0$ , informs us about similar underlying determinants of our reservation wage measures. The Breusch-Pagan Lagrange multiplier test is then used to test the null hypothesis of zero cross-equation error correlation. If the correlation is significantly different from zero, the SUR estimation yields efficiency gains over OLS. Second, the SUR estimation allows testing cross-equation constraints, e.g.,  $\beta_j = \gamma_j$ . This is particularly useful, since we would like to understand whether observed determinants have the same impact on both reservation wage measures.

**[Insert Table 7 about here]**

Table 7 contains the results from the SUR framework. We largely follow Le Barbanchon et al. (2019a) in the choice of our explanatory variables. Most factors affect the two measures in the same direction and with similar intensity. Male subjects and subjects with high school degree (abitur) ask for a higher wage both in the survey and in the experiment; unemployed individuals ask for a lower wage in both domains. Age and marital status have a significantly positive effect on the survey measure, but not on the experimental measure. Nevertheless, the effects go in the same direction for both measures. Column (3) shows the results of Wald tests of cross-equation coefficient testing, which test the null hypothesis of equal coefficients. We cannot reject equality of coefficients for gender, age, unemployment status and the number of children at reasonable levels of significance. We can indeed reject equality of coefficients for high school degree and marital status. The difference in coefficients here, however, seems to be an issue of magnitude rather than direction of effect.

We find a positive correlation of about 0.26 between the unobserved factors in the two regressions. The Breusch-Pagan Lagrange multiplier test rejects the null hypothesis of zero error correlation on the one percent significance level. Thus, the two reservation wage measures have similar unobserved determinants.

## 5 Conclusion

In this paper, we correlate a survey measure of the reservation wage with an experimental reservation wage. The experimental reservation wage is for a one-hour job. Since this job is a one-time opportunity, the experimental reservation wage only reflects to what extent individuals are willing to trade-off leisure versus consumption. In contrast, the survey measure is potentially influenced by search concerns, i.e., the arrival rate of job offers and the distribution over wage offers. Nevertheless, we find for both employed and unemployed individuals a strong positive correlation between the two measures. The non-incentivized survey reservation wage therefore is informative about how individuals solve the consumption-leisure trade-off.

For unemployed individuals the two measures are closely related: A one Euro increase in the survey reservation wage on average translates into a 1.16 Euro increase in the experimental reservation wage. Thus, the survey reservation wage seems to capture the consumption-leisure trade-off quite well for long-term unemployed individuals. For employed individuals, the link is weaker, but still significant in most specifications. Also, we find that, within the group of employed individuals, the association between the two reservation wage measures is stronger among those who face a higher risk of unemployment. By comparing participants and non-participants, we show that these results are not affected by selection into our experiment. We moreover demonstrate that demographic variables, i.e., gender, age, education, influence the two reservation wage measures in similar way.

## Tables

Table 1: Measures of Reservation Wages in Surveys and Administrative Data

Dataset Period, Country ( <i>N</i> )	Reservation Wage Item	Studies
CPS Job Search Supplement 1976, US (2,228 – 3,200)	What is the lowest wage or salary you would accept (before deductions) for this type of work?	Feldstein and Poterba (1984)
PSID 1980–1987, US (6,500 – 7,000)	What is the lowest wage you would be willing to take home as pay?	Haurin and Shridar (2010)
NLS Youth 1979–1994, US (12,000)	What would the wage or salary have to be for you to be willing to take it?	Holzer (1987), Holzer (1986), DellaVigna and Paserman (2005)
Political and Economic Planning 1972, UK (627)	What is the lowest wage you would accept in a new full time job? Would you tell me the lowest amount you would prepared to accept after stoppages?	Lancaster and Chesher (1983), Lancaster and Chesher (1984)
GSOEP 1987–1998, Germany (20,000)	How high would your net income or salary [per month] have to be for you to take a position offered to you?	Pannenberg (2010), Koenig et al. (2016)
British Household Panel Survey 1991–2009, UK (9,000)	What is the lowest weekly take home pay you would consider accepting for a job? About how many hours in a week would you expect to have to work for that pay?	Brown et al. (2011), Koenig et al. (2016)
French public employment service 2006–2012, France (320,000)	What minimum gross wage do you accept to work for?	Le Barbanchon et al. (2019a), Le Barbanchon et al. (2019b)
Survey of Unemployed Workers New Jersey 2009–2010, US (6,025)	Suppose someone offered you a job today. What is the lowest wage or salary you would accept (before deductions) for the type of work you are looking for?	Krueger and Mueller (2016), Hall and Mueller (2018)

Table 2: Descriptive Statistics

	experimental sample mean (sd)	invited sample mean (sd)	full sample mean (sd)
experimental reservation wage [9, 35]	17.99 (7.29)		
survey reservation wage	11.12 (5.07)	10.20 (4.78)	9.93 (4.40)
male	0.47 (0.50)	0.50 (0.50)	0.46 (0.50)
age in years	44.01 (11.38)	44.53 (11.61)	44.04 (12.49)
unemployed	0.18 (0.38)	0.25 (0.43)	0.22 (0.42)
abitur	0.44 (0.50)	0.26 (0.44)	0.26 (0.44)
married	0.39 (0.49)	0.40 (0.49)	0.40 (0.49)
number children	1.18 (1.16)	1.31 (1.26)	1.33 (1.28)
observations	630	3,212	5,652

The descriptive statistics refer to a sample of individuals with non-missing information on all variables that is used in the Tobit analysis. Our sample consists of two groups. Individuals who reported a valid reservation wage (495), and individuals who replied that they would not even do the job if the wage was 35 Euros (137).

Table 3: Estimated correlation of the experimental reservation wage on survey reservation wage

	(1) OLS	(2) Tobit	(3) OLS logs	(4) OLS	(5) Tobit
survey reservation wage	0.490*** [0.077]	0.737*** [0.123]		0.372*** [0.080]	0.534*** [0.128]
log survey reservation wage			0.372*** [0.046]		
unemployed				-8.450*** [2.321]	-13.871*** [3.611]
unemployed $\times$ survey reservation wage				0.786*** [0.285]	1.003*** [0.385]
constant	12.470*** [0.902]	14.607*** [1.533]	1.941*** [0.108]	14.068*** [0.985]	17.657*** [1.673]
observations	494	631	494	494	631
R-squared	0.096		0.119	0.125	

Notes: \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ ; robust standard errors in brackets; Column (3): log-log-specification. In all specifications, we control for high meaning treatment.



Table 4: Estimated correlation of the experimental reservation wage on survey reservation wage with controls

	(1) OLS	(2) Tobit	(3) OLS logs	(4) OLS	(5) Tobit
survey reservation wage	0.365*** [0.115]	0.549*** [0.169]		0.147 [0.114]	0.236 [0.186]
log survey reservation wage			0.290*** [0.069]		
unemployed	-4.074** [1.662]	-7.090*** [2.686]	-0.209** [0.086]	-13.296*** [2.829]	-19.411*** [4.365]
unemployed × survey reservation wage				1.011*** [0.291]	1.307*** [0.389]
male	2.075*** [0.738]	2.145* [1.231]	0.123*** [0.039]	2.007*** [0.725]	2.193* [1.212]
age in years	0.000 [0.032]	0.135** [0.055]	-0.000 [0.002]	-0.007 [0.031]	0.133** [0.054]
abitur	0.637 [0.702]	-2.147* [1.197]	0.034 [0.039]	0.562 [0.688]	-2.110* [1.174]
married	0.068 [0.703]	1.547 [1.221]	-0.007 [0.038]	0.068 [0.685]	1.436 [1.198]
number children	-0.276 [0.296]	-0.724 [0.534]	-0.015 [0.016]	-0.334 [0.282]	-0.786 [0.516]
net income	0.001 [0.001]	0.001 [0.001]	0.000 [0.000]	0.002** [0.001]	0.002** [0.001]
hours worked	-0.102** [0.049]	-0.080 [0.081]	-0.005** [0.002]	-0.142*** [0.048]	-0.139* [0.082]
constant	15.475*** [2.213]	12.651*** [0.516]	2.222*** [0.176]	18.026*** [2.212]	12.492*** [0.512]
observations	461	588	461	461	588
R-squared	0.139		0.158	0.175	

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ ; robust standard errors in brackets; Column (3): log-log-specification. For employed individuals: net income and hours worked in the main job. For unemployed individuals: unemployment benefits and zero hours worked for individuals without a mini job; deducted benefits plus (net) income and hours worked for individuals with mini job. In all specifications, we control for high meaning treatment.

Table 5: Estimated correlation of the experimental reservation wage on survey reservation wage - for employed respondents only, controlling for risk of unemployment

	(1) OLS	(2) Tobit	(3) OLS	(4) Tobit
survey reservation wage	0.300*** [0.086]	0.412*** [0.140]	0.115 [0.118]	0.086 [0.187]
high unemployment risk	-4.267** [2.155]	-6.042* [3.546]	-3.133 [2.181]	-6.778* [3.600]
high unemployment risk $\times$ survey reservation wage	0.509** [0.211]	0.845*** [0.316]	0.402* [0.218]	0.924*** [0.326]
male			1.651* [0.917]	0.791 [1.465]
age in years			0.017 [0.037]	0.163*** [0.063]
abitur			0.686 [0.775]	-2.205* [1.337]
married			0.292 [0.776]	1.588 [1.325]
number children			-0.517 [0.329]	-1.140** [0.578]
net income			0.001** [0.001]	0.003** [0.001]
hours worked			-0.126*** [0.047]	-0.147* [0.083]
constant	14.403*** [1.171]	17.954*** [2.010]	16.968*** [2.443]	16.358*** [4.175]
observations	387	508	356	469
R-squared	0.085		0.132	

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ ; robust standard errors in brackets; Column (3): log-log-specification. In all specifications, we control for high meaning treatment. Risk for unemployment is calculated from a median-split on unemployment rates for different occupational groups based on the German classification of occupations (KldB 2010, Bundesagentur für Arbeit) and publicly available data on occupation-specific unemployment rates from the Federal Employment Agency. The median split is performed for 1-digit occupation groups, the results are robust to a 3-digit occupation median split, albeit not statistically significant.

Table 6: Estimated correlation of survey reservation wage and experimental reservation wage, Heckman selection model

	(1)	(2)	(3)	(4)
		experimental reservation wage		
		invited sample	75% PASS sample	
<i>outcome equation: experimental reservation wage</i>				
survey reservation wage	0.484*** [0.071]	0.370*** [0.076]	0.479*** [0.078]	0.368*** [0.084]
unemployed		-8.443*** [2.100]		-8.480*** [2.115]
unemployed × survey reservation wage		0.787*** [0.220]		0.789*** [0.222]
constant	13.264*** [3.015]	14.338*** [3.009]	13.709*** [4.360]	14.538*** [4.331]
<i>selection equation: participation in experiment</i>				
survey reservation wage	0.013** [0.006]	0.013** [0.006]	0.019*** [0.005]	0.022*** [0.005]
unemployed		-0.006 [0.155]		0.190 [0.146]
unemployed × survey reservation wage		-0.006 [0.016]		-0.016 [0.015]
constant	-1.590*** [0.081]	-1.568*** [0.093]	-1.920*** [0.074]	-1.968*** [0.082]
observations	3,082	3,082	5,530	5,530
inverse Mill's ratio	-0.498 [1.812]	-0.173 [1.827]	-0.635 [2.190]	-0.238 [2.146]

Notes: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1; standard errors in brackets; Heckman models are estimated using two-step procedure; information on whether individuals were invited via email serves as exclusion restriction in the participation equation.

Table 7: Estimated coefficients of joint estimation of log experimental reservation wage and log survey reservation wage

	(1) log experimental reservation wage	(2) log survey reservation wage	(3) Wald statistic [p-value]
male	0.131*** [0.035]	0.072** [0.030]	2.24 [0.135]
age in years	0.002 [0.002]	0.004*** [0.001]	0.84 [0.360]
unemployed	-0.157*** [0.045]	-0.209*** [0.038]	1.06 [0.303]
abitur	0.128*** [0.036]	0.233*** [0.030]	6.69*** [0.010]
married	0.016 [0.039]	0.093*** [0.033]	3.11* [0.078]
number children	-0.009 [0.017]	0.012 [0.014]	1.15 [0.284]
constant	2.623*** [0.074]	2.006*** [0.063]	
observations	494	494	
R-squared	0.089	0.239	
residual correlation, $\rho$	0.258		
Breusch-Pagan statistic	32.77 (0.000)		

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ , standard errors in brackets in Columns (1) and (2); In all specifications, we additionally control for high meaning treatment. Column (3) provides the results from a Wald test on the equality of estimated coefficients in Columns (1) and (2). The Breusch-Pagan test tests the null hypothesis of zero error correlation between Equations (3) and (4).

Figures

Figure 1: Association between reservation wages and labor supply

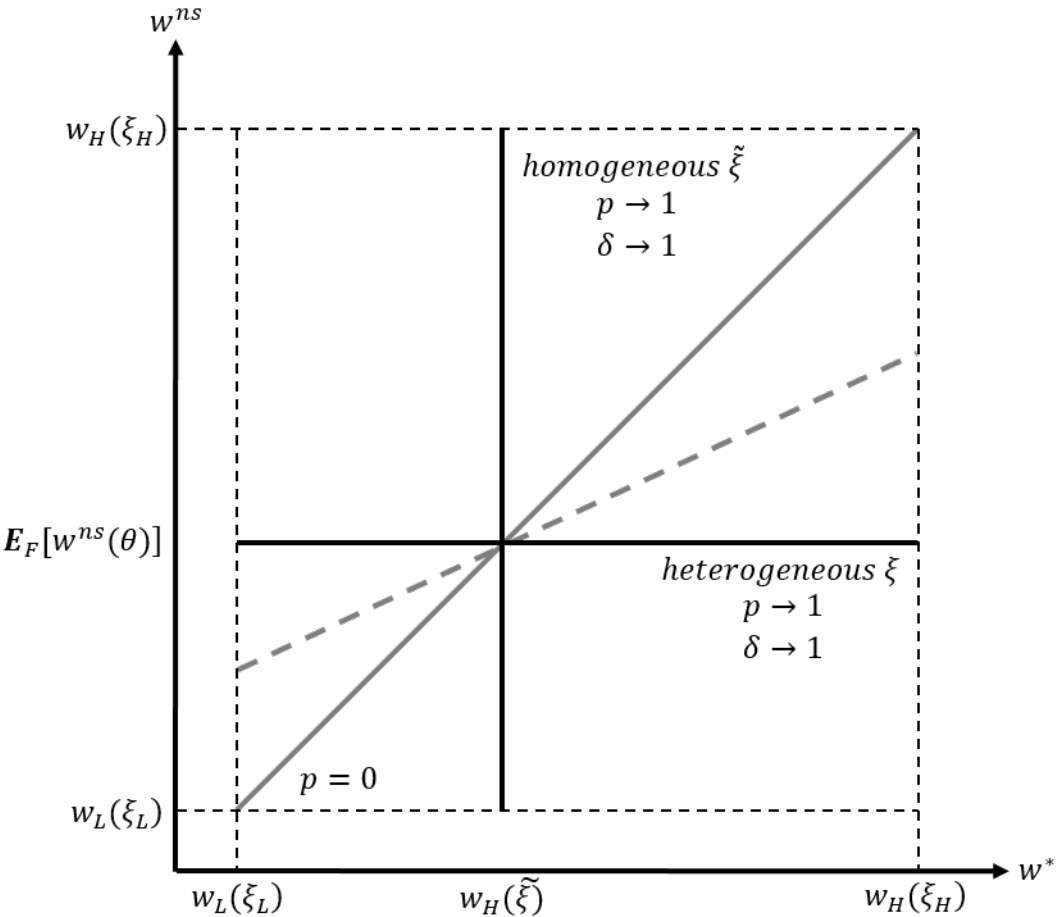


Figure 2: Predicted experimental reservation wage, by employment status

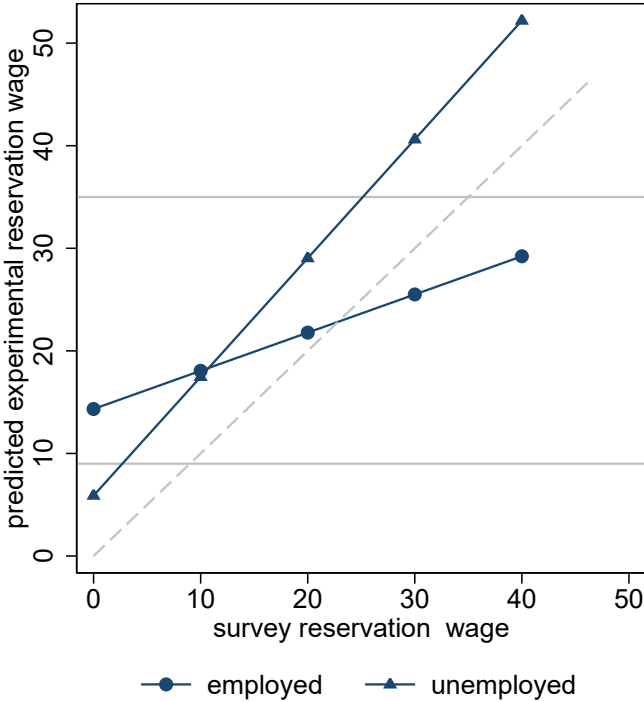
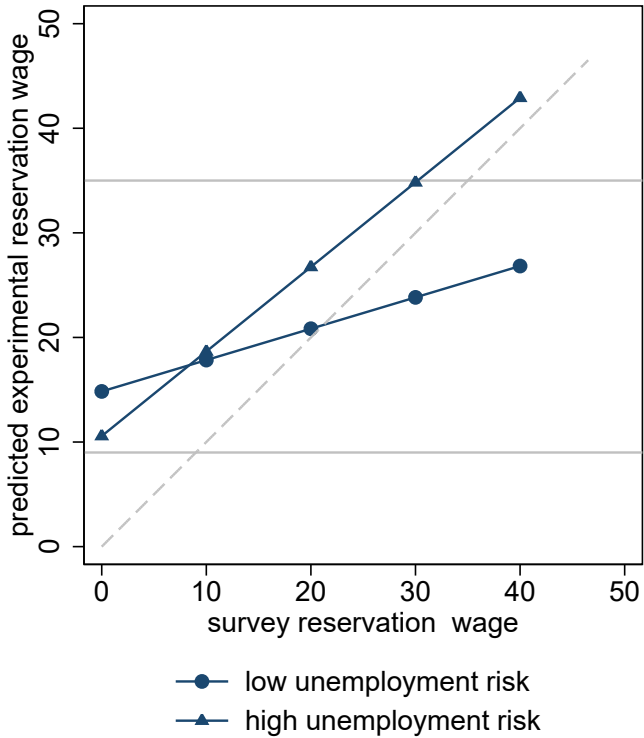


Figure 3: Predicted experimental reservation wage, by unemployment risk



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## Appendix

### Tables

Table A1: Estimated correlation of the experimental reservation wage and survey reservation wage, inverse probability weighting (IPW)

	(1)	(2)	(3)	(4)
		experimental reservation wage invited sample	75% PASS sample	
survey reservation wage	0.494*** [0.104]	0.333*** [0.094]	0.502*** [0.101]	0.366*** [0.095]
unemployed		-9.259*** [2.274]		-8.763*** [2.251]
unemployed×survey reservation wage		0.872*** [0.282]		0.826*** [0.279]
constant	11.034*** [1.555]	12.796*** [1.536]	10.865*** [1.526]	12.324*** [1.556]
observations	494	494	494	494
R-squared	0.134	0.165	0.132	0.156

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ ; standard errors in brackets; Probability weights are obtained from predicted probabilities of probit regressions on being selected into the experiment. Predictors are: survey reservation wage, unemployed, unemployed×survey reservation wage, male, age, abitur, married, number of children. In the weighted regressions, we additionally control for high meaning treatment.

## Invitation Letter (English Translation)

Dear [name],

Thank you very much for participating once more in the study “Life quality and social security” this year. You have contributed to the success of the study, which since 10 years has provided scientists and politicians with important information about the life circumstances of the German population.

Since life in Germany is changing, we too want to pursue new paths in research. In cooperation with the universities of Mannheim and Leuven, we implement the internet-based study “Personality and employment”, in addition to “Life quality and social security.” The study consists of a short survey, after which we ask the participants to take part in a small case study. In the case study, it is possible to earn some money.

From the participants in the study “Life quality and social security” we randomly selected candidates for participation in the additional case study – you are among them. We kindly invite you to participate. Of course, participation in this additional study is voluntarily, and there will not be any negative consequences if you decline to participate. It is, however, crucial for the validity of the study that possibly all selected individuals participate. Among those who participate both in the survey and the case study, we raffle 50 amazon vouchers with a value of 25 Euros each (for at most 1000 participants). In addition, you have the possibility to earn something in the case study (between 9 and 35 Euros). Participating in the study is for technical reasons only possible until August 20, 2017. Unfortunately, since the study has limited financial means, only the first 1000 individuals that register can participate. You can participate in the study using the following link:

[www.pass-arbeitswelt.de](http://www.pass-arbeitswelt.de)

Your personal access code is: [code]

This code ensures that only those invited can participate in the study. Your data are saved anonymously. The collected data are stored separately from your name and email address. To evaluate the data from the additional study “Personality and employment” together with the survey “Life quality and social security” we merge the data using a unique respondent number. By participating in the survey you agree to the data being merged. You may revoke your consent at any time. All information can be found in the data protection statement.

Independently of your participation, we will ask you again the coming year to participate as usual in the survey “Life quality and social security.”

We are looking forward to your participation. Thank you very much and kind regards,

## Experimental Instructions

The following screenshots show the instructions for the experiment with the English translation below.

7/10/2017

WorkMeaning

**Wir bieten Ihnen nun noch an, an unserer Praxisstudie teilzunehmen.**

Unsere Praxisstudie ist etwas anders als Sie es von der Studie "Lebensqualität und soziale Sicherung" gewohnt sind. Das Ziel unserer Praxisstudie ist die Digitalisierung von Texten. Uns liegen die Original-Texte als Scan vor. Damit wir die Daten verwenden können, müssen sie noch abgetippt werden.

**Bei den Texten handelt es sich um Forschungsergebnisse, die angehende Ärzte an der Ludwig-Maximilians Universität München gewonnen haben. Um sie für die medizinische Forschung nutzbar zu machen, müssen diese Texte digitalisiert werden. Mit Ihrer Arbeit können Sie also einen Beitrag zur medizinischen Grundlagenforschung leisten.**

[Zurück](#)[Weiter](#)<https://www.vragenlijst.centerdata.nl/qst/index.php>

1/1

**We now offer you the opportunity to take part in our case study.**

Our study is somewhat different from what you are used to in the study “Life quality and social security.” The goal of our study is to digitalize texts. We have scans of the original texts. In order to use these texts, they have to be type-written.

**The texts feature results of research conducted by prospective medical doctors at the Ludwig-Maximilians University in Munich. They have to be digitalized to make them accessible to future medical research. Hence, with your efforts, you can contribute to medical research.**

7/10/2017

WorkMeaning

---

Wir bieten Ihnen an, für **eine Stunde** an unserer Praxisstudie mitzuarbeiten – also kurze Texte abzutippen. Diese Arbeit können Sie zu Hause an Ihrem Computer erledigen. Sie können frei wählen, wann innerhalb der nächsten 7 Tage Sie arbeiten wollen.

Die von Ihnen geleistete Arbeit wird natürlich vergütet. Die Bezahlung beträgt zwischen 9,00 Euro und 35,00 Euro pro Stunde. Den Lohn erhalten Sie im September 2017 ausbezahlt, wenn Sie eine Stunde gearbeitet haben.

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[Zurück](#)[Weiter](#)<https://www.vragenlijst.centerdata.nl/qst/index.php>

1/1

We offer you to work – that means to type short texts – for our study for **one hour**. You can do this at home on your computer. You can choose freely when you would like to work during the next 7 days.

Of course, you will be reimbursed for your efforts. The hourly wage is between 9,00 and 35,00 Euros. You will receive the payment in September 2017 if you have worked for an hour.

7/10/2017

WorkMeaning

Auf der nächsten Seite können Sie auswählen, zu welchem Stundenlohn Sie die Arbeit annehmen möchten. Sie können jeden Lohn zwischen 9,00 Euro und 35,00 Euro wählen.

Der Computer lost Ihnen dann zufällig eine Zahl zwischen 9,00 und 35,00 Euro als Lohn zu.

Wenn diese Zahl **größer** ist als der von Ihnen geforderte Stundenlohn, so erhalten Sie die geloste Zahl als Stundenlohn.

Wenn diese Zahl **kleiner** ist als der von Ihnen geforderte Stundenlohn, so können Sie nicht an der Praxisstudie mitarbeiten.

Sie können auch angeben, dass Sie an der Praxisstudie auf keinen Fall teilnehmen möchten.

[Zurück](#)[Weiter](#)<https://www.vragenlijst.centerdata.nl/qst/index.php>

1/1

On the next page, you can choose the hourly wage at which you would be willing to accept the job. You can choose a wage between 9 and 35 Euros.

The computer then randomly chooses a number between 9 and 35 as your wage.

If this number is **higher** than the hourly wage you asked for, you will receive the number as your hourly wage.

If this number is **lower** than the hourly wage you asked for, you cannot take part in our study.

You can also state that you do not want to take part in our study at all.

7/10/2017

WorkMeaning

Beachten Sie: Je höher Ihr geforderter Stundenlohn ist, desto niedriger ist die Wahrscheinlichkeit, dass Sie an der Praxisstudie teilnehmen können. Wenn Sie sicher gehen wollen, dass Sie an der Praxisstudie mitarbeiten können, geben Sie 9,00 Euro als geforderten Stundenlohn an. Wenn Sie an der Praxisstudie nur mitarbeiten wollen, wenn der Stundenlohn größer ist als (beispielsweise) 16 Euro, so geben Sie 16 Euro als geforderten Stundenlohn an.

Ich nehme den Job an, wenn der Stundenlohn mindestens

9  Euro beträgt (bitte geben Sie eine Zahl zwischen 9,00 und 35,00 ein).

☐ Ich möchte an der Praxisstudie selbst dann nicht teilnehmen, wenn der Stundenlohn 35 Euro beträgt.

**Zur Erinnerung: Bei dem Job geht es um das Abtippen von Texten. Bei den Texten handelt es sich um Forschungsergebnisse, die angehende Ärzte an der Ludwig-Maximilians Universität München gewonnen haben. Um sie für die medizinische Forschung nutzbar zu machen, müssen diese Texte digitalisiert werden. Mit Ihrer Arbeit können Sie also einen Beitrag zur medizinischen Grundlagenforschung leisten.**

[Zurück](#)[Weiter](#)<https://www.vragenlijst.centerdata.nl/qst/index.php>

1/1

*Please keep in mind: The higher the hourly payment is that you request, the lower is the probability that you can participate in the study. If you want to make sure you can work in the study, indicate 9 Euros as a requested hourly payment. If you only want to work in the study if the hourly payment is bigger than (for example) 16 Euros, then you indicate 16 Euro as a requested hourly wage.*

I will accept the job if the hourly payment is at least

X Euros (please enter a number between 9,000 and 35,00).

I do not want to participate in the study, even if the hourly payment is 35,00 Euros.

**Reminder: This job is about the typing of texts. The texts are research results gained by prospective physicians at the University of Munich. In order to make them usable for medical research, they have to be digitalized. With your work you can contribute to fundamental medical research.**