

# Comparing Methods to Estimate Valuations of Job Attributes

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## Abstract

We estimate the value of different non-wage job amenities among a group of job seekers in Egypt. We use a number of randomly assigned elicitation methods as well as a discrete choice experiment administered to all participants. We find that willingness to pay estimates vary substantially across elicitation methods, both in nominal terms as well as with respect to a baseline salary, which suggests estimates obtained using stated preference should be validated with revealed preference methods to assess their validity. Estimates from certain widely used elicitation methods have the opposite sign from what economic theory would predict, which calls into question their reliability. We also find heterogeneous willingness to pay estimates within elicitation methods by gender, level of education and spell of job search.

## 1 Introduction

In order to attract workers, firms include nonwage amenities in their compensation packages (Oyer and Schaefer, 2005; Oyer, 2008). If workers have a higher valuation for those attributes the employers' cost of providing them there could be an overall improvement of welfare and efficiency in the labor market. However, it is not entirely clear what is the most appropriate way of estimating job seeker valuation of non-wage job attributes. Economists have traditionally relied on revealed preference approaches in non-experimental settings, based on the hypothesis that if two jobs are similar except for the presence of a non-wage amenity, the difference in wage offered between these jobs should reflect the value assigned to that attribute (Rosen, 1986). Despite progress made by the availability of longitudinal data on workers who switch jobs and/or firms (Lavetti,

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2018; Sorkin, 2018), the results obtained using these methods tend to be biased since researchers do not typically observe the entire choice set of each individual.

In this paper, we instead turn to a series of stated preference approaches to estimate willingness to pay for certain job attributes among a group of job seekers in Egypt. As opposed to revealed preference methods, stated preference methods directly ask individuals about the value they assign to certain attributes and has been used extensively in environmental economics to price non-market goods.

We work with an NGO that helps match job seekers with employers. When the job seekers apply for assistance with their job search we invite them to fill out a form that attempts to elicit their preferences over six different non-wage attributes including commute times, health insurance, and the need to work on weekends. The literature has used four main methods to estimate the value placed on attributes . This includes open-ended questions, the “pay-card” method which provides a list of values to choose from, a double bounding method, and more recently discrete choice experiments. However, previous research has shown that each method can yield different results (Boxall, Adamowicz, Swait, Williams, and Louviere, 1996; Adamowicz, Boxall, Williams, and Louviere, 1998), and there is no clear consensus on which is preferred. We randomize which elicitation method job seekers use allowing us to compare the estimates produced from the different methods.

We find large difference across elicitation methods in the value assigned to the job attributes we consider. For example, while individuals assigned to open-ended questions (where they are asked to report the minimum salary for which they would accept a job with the given characteristics) are willing to give up 12.2% of their wage if the job provides them with health insurance for them, those selected to the double-bound dichotomous choice format (in which respondents are given take-it-or-leave-it job offers with different attributes and salaries) report a willingness to pay of 7.2% of the wage they would take for the same job without health insurance.

We also find that some of these elicitation methods present shortcomings that should be taken into account when carrying out these surveys: open-ended questions (the most commonly used elicitation format in household and labor force surveys) are sensitive to the presence of outliers, producing very noisy estimates of attribute values.

Even after we account for outliers by winsorizing responses, we observe that estimates for certain

attributes have the opposite sign that would be expected by economic theory. This suggests that estimates obtained with this approach should be taken with caution, and researchers should avoid using it despite its apparent simplicity.

On the other hand, responses to the payment card elicitation format (where respondents are given a number of options from where to choose their reservation wage for a given job) suffers from “anchoring” behavior, whereby both the average reservation wage and the value assigned to certain attributes depends on the minimum and maximum values shown to respondents, even if the middle values and the increments are the same across sets of options. Moreover, we find similar issues with the sign of some willingness to pay estimates to those observed with the open-ended format.

Estimates using double-bound dichotomous choice questions and a discrete choice experiment (DCE) are precise and have the correct sign. However, the magnitudes observed in the former are much larger than those of the latter, and estimates from the double-bound dichotomous choice for distance to work are of the same magnitude regardless of the travel time, while estimated compensation from the DCE is increasing in travel time, as would be expected.

We are able to use our data on job seeker characteristics to explore differences by gender in the value assigned to some job attributes. The results from the DCE suggest that women require higher compensation for a job that is further away from their homes relative to men. The same relationship holds for the requirement to work on weekends. On the other hand, they value health insurance less than men. In contrast, we do not find important differences for attribute valuation across marital status, education or time spent looking for a job.

We contribute to the literature that consider labor market frictions and the valuation of non-market goods. This includes work that estimates the value of alternate work arrangements at the time of applying for a job (Mas and Pallais, 2017), or fringe benefits such as healthcare and bonuses among those already employed (Eriksson and Kristensen, 2014). Instead of relying only on a discrete choice experiment to estimate the value of non-pecuniary benefits, we combine different elicitation methods that should in principle yield similar results.

Although we are not the first ones to find differences in willingness to pay arising from using different elicitation formats (see for example Brown, Champ, Bishop, and McCollum, 1996; Welsh and Poe, 1998; Cameron, Poe, Ethier, and Schulze, 2002) or biases arising from some of these formats (Rowe, Schulze, and Breffle, 1996), previous research has focused on the valuation of either

non-market goods (generally related to environmental amenities) or public goods. Instead, we include in our study both non-market and market goods as amenities of what can be considered a pure private good such as a job vacancy.

Even if stated preference methods could suffer from hypothetical bias, the fact that some of the amenities we include can be purchased in the market should reduce the likelihood that different elicitation methods would yield different willingness to pay for these attributes. The fact that we find large differences across elicitation methods suggests that results obtained from stated preference methods only should be taken with caution, and more research should be devoted at validating stated preference approaches with revealed preference methods. Although this has been done in other contexts (Brown et al., 1996), comparisons of WTP for non-wage job attributes are still lacking. Maestas, Mullen, Powell, Von Wachter, and Wenger, 2018 make an attempt to do this, although they study whether valuations for amenities obtained from a choice experiment correlate with the actual amenities that individuals have in their jobs.

The rest of the paper is structured as follows: Section 2 describes the experimental design and details all the elicitation formats we use, along with the method we use in each case to estimate the value assigned to each job characteristic. Section 3 we present our main results, comparing the estimates obtained with each elicitation method and discussing their strengths and weaknesses. In turn, in Section 4 we explore the heterogeneity in attribute valuation by background characteristics including gender, marital status, level of education and time spent looking for a job. Finally, Section 5 concludes with a discussion of the implications of our results and suggestions for future research.

## 2 Data and elicitation methods

We collected data about job seekers' valuation for non-wage job attributes in collaboration with the National Employment Pact (NEP), an NGO based in Cairo that provides job matching services through their partnership with over 700 employers in Egypt. Approximately 95% of the employment opportunities that NEP offers are blue collar. They also require firms to include social and medical insurance and a minimum pay of EGP 800 (EGP 1000 including pecuniary benefits) for all the vacancies they help filling.

Every time a job seeker approached NEP to register for their services, the employment officer

would encourage the job seeker to fill out our survey. This survey included a few questions for the job seeker about their job search activities, and a series of hypothetical questions that would allow us to infer the value they place on five different characteristics of a job: travel time to the workplace, health insurance, whether they would have to work some weekends each month, whether meals were provided at workplace and whether the job offered in-site daycare. Table 1 shows the values that each of these attributes could take.

We chose some of these characteristics based on the type of employment opportunities that NEP usually offers to job seekers (such as health insurance), while others (e.g. in-site cafeteria) were based on suggestions from the NEP staff about the amenities that job seekers care about.

We fielded our survey between August 2018 and March 2019. During that time, 1934 job seekers who approached NEP to register to be matched with a firm agreed to complete the survey. Individuals were asked a few additional questions about their job search activities and they were then required to answer a series of hypothetical questions regarding job offers. These job offers differed in six aspects: wage, commute time to work, whether they included health insurance, the need to work during certain weekends, and whether the establishment provided meals and/or daycare. We chose these characteristics based on the requisites that NEP imposes to their partners in order to help them fill a vacancy, as well as suggestions from the NEP staff regarding aspects that individuals value when looking for a job.

With the exception of the discrete choice experiment that we implemented, all respondents within a treatment arm observed the same job descriptions and in the same order. Each job offered differed from the baseline offer (the first one shown) in only one attribute in order to make the task easier for respondents. However, to estimate if there is an interaction effect between certain amenities, within each elicitation method we randomly assigned individuals into two different set of offers: in one set the baseline attributes does not include health insurance, while the second set has health insurance for the respondent and her/his spouse as the default.

Table 2 shows summary statistics for the sample who completed our survey (Panel A) as well as the corresponding values for unemployed individuals in the 2017 Harmonized Labor Force Survey (HLFS, OAMDI, 2019) (Panel B). Individuals in our sample are relatively young, predominantly male and single. The average job seeker has completed high school education and has been looking for a job for 10 months by the time s/he registers with NEP. Job seekers usually spend approximately

15 hours a week looking for a job. However, job search intensity is quite low: almost 50% of the individuals surveyed use only one method to look for a job, and two thirds of job seekers used at most two methods to look for a job. Unfortunately, we do not have information about the activities these individuals do besides job search.

Looking at differences across gender, men tend to be older and slightly less educated than women. When they registered with NEP and filled our survey, they have been on average looking for a job for a month less than women, and they report spending more time looking for a job than female respondents.

Compared to unemployed individuals in the 2017 HFLS, male respondents to our survey are older, but female respondents are younger than the unemployed in the HLFS. Unemployed women in the HLFS constitute 47% of the sample, while they only account for 30% of our survey respondents. Marriage rates are similar across samples, as are years of education. Finally, our survey respondents have been looking for a job for a much shorter period of time than unemployed individuals in the HLFS.

## **2.1 Elicitation methods and estimation strategies**

As we mentioned in the previous section, individuals were required to answer a series of questions that allow us to estimate their valuation for different non-wage job attributes. In order to do this, we randomized respondents into three different groups, which correspond to three different elicitation methods: open ended questions, pay card questions, and double-bound dichotomous choice questions. Each format contained seven questions with the same job descriptions across elicitation methods so the answers are not affected by how the jobs were described. In addition to this, we implemented a discrete choice experiment that was included in all surveys. In this section, we describe in detail each method used, including their strengths and drawbacks, and the method we use in each case to estimate the willingness to pay for each of the included attributes.

### **2.1.1 Open-ended Questions**

Open-ended questions is the most common type of elicitation method used in labor force surveys (see for example Faberman, Mueller, Şahin, and Topa, 2017 and Hall and Mueller, 2018). They amount to directly asking an individual what is the minimum wage required for her/him to take a

job. The answer is typically considered to be the reservation wage of the person.

Contrary to most surveys which only ask one such question and do not give any detail about the job in question, in our survey, individuals assigned to this type of elicitation method were faced with seven hypothetical job offers, all of which described how far away they were from the individual's home (in minutes), whether it included healthcare for the respondent and his/her spouse, whether it required the person to work certain weekends instead of a weekday or not, and whether meals and daycare was included as a benefit of the job. In each case, after the job was described, we asked the person to state the minimum salary for which s/he would take the offer. Figure 1 provides an example of the type of questions respondents faced.

The main benefit of this method is that it avoids any type of bias that may stem from showing the individual one or more values s/he can pick from. Moreover, because each response is a single value rather than an interval, it is straightforward to estimate the value placed on each of the non-wage attributes. These can be obtained as an hedonic regression of the answers of the individuals on the different attributes<sup>1</sup>. The following equation presents the precise model we estimate:

$$W = \alpha + \sum_{k \in \{6,9,12\}} \beta_k \times Commute_k + \sum_{d \in \{S,SP\}} \delta_d \times Hins_d + \gamma Weekend + \mu Meals + \theta Daycare + \nu Open\_type + \varepsilon$$

Where  $W$  is the wage stated by the respondent and each covariate represents a dummy for whether the attribute was present. The last dummy ( $Open\_type$ ) takes value one if the baseline offer does not include health insurance and zero if it includes health insurance for the respondent and his/her spouse. Since this treatment was randomized at the individual level, we do not include individual fixed effects in our main specification but results are not sensitive to their inclusion.

On the other hand, the main drawback of this elicitation method is that because individuals are allowed to input any value, estimates will be sensitive to the presence of outliers. These may be present due to the fact that individuals may have an incentive to state a higher wage than they would really be willing to accept. Moreover, although seemingly simple, these questions do not reflect a situation that job seekers typically encounter when receiving a job offer, so they may have difficulty in coming up with a reasonable figure. As evidence of these issues, 40% of all answers

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<sup>1</sup>Because the same individual is asked seven different questions, our regressions will include individual fixed effects to account for unobserved characteristics that may drive the answers of each person

are above the highest value specified in the close-ended method used, and 98% of the answers are multiples of 100 despite individuals being able to give any integer amount as an answer.

### **2.1.2 Payment Card**

Instead of allowing individuals to choose any wage as the minimum they would be willing to accept each hypothetical job, the payment card method (Mitchell and Carson, 1981) presents a series of values from which the respondent shall choose from. The individual is expected to pick the lowest value that is higher than her true reservation wage (e.g. if the card shows values from EGP 1000 to EGP 2000 in intervals of 200, and a person's reservation wage for the described job offer is 1500, she should choose EGP 1600 as her answer). Figure 2 provides an example of the questions asked in the survey.

By bounding the possible choices of the respondent, the payment card format is not affected by outliers. However, there is evidence that responses can suffer from anchoring bias: the response given by an individual is affected by the range of values shown, even if her reservation wage is contained in all the ranges shown (Rowe et al., 1996). In order to test if there is any bias stemming from the range of values presented, individuals who were faced with these questions were randomly assigned to one of two different lists of salaries to choose from: one ranging from 1000 to EGP 2200 and another ranging from EGP 1400 to EGP 2600, in both cases with EGP 200 increments.

Because responses only give us a bound within which the actual reservation wage for each hypothetical job lies, we use an interval data model that we estimate via maximum likelihood (Cameron and Trivedi, 2005). In this case, besides the covariates for each job characteristic we include a dummy for the type of baseline offered shown as well as for the range of values in the payment card that individuals observe.

### **2.1.3 Double-bound Dichotomous Choice**

The dichotomous choice method has been one of the most popular contingent valuation methods used by researchers to value non-market goods (see for example Hanemann, Loomis, and Kanninen, 1991 and Carson et al., 2003). This method presents individuals with a hypothetical job offer that describes all the characteristics previously mentioned (commute time, health insurance, in-site cafeteria and daycare, and flexible shifts), and then asks whether the respondent would take the



job for a given salary. Figure 3 shows an example of this elicitation format.

In its most basic form, this is simply a take-it-or-leave-it series of offers (one for each job described) of the type job seekers usually face. However, these questions convey little information: a "yes" only means that the respondent's reservation wage for the job is between 0 and the proposed amount, and a "no" that the reservation wage is bounded between that amount and infinity. For this reason, we adopted a double-bound version of this method, which consists of asking an additional question for each hypothetical job offer: if the respondent accepted (rejected) the first offer, the second question lowers (raises) the salary offered by an amount chosen at random.

Similarly to the case of the payment card format, the results of the double-bound dichotomous choice format are limits on the value that the respondent assigns to each job offer, although in this case the intervals are not fixed since the initial and follow-up wages were chosen at random. We therefore also estimate the parameters of the model via maximum likelihood.

If the individual answers "Yes" to the first question, and "No" to the second, we know that her reservation wage for the proposed job lies between the second and the first values shown. Similarly, if the answers are "No" and "Yes" respectively, the person's reservation wage would lie between the first and second bids. If the individual replies "No" to both questions, we can bound her reservation wage from below by the second amount offered, while if she answered "Yes" to both questions, we can bound her reservation wage between 0 and the second offered wage.

#### **2.1.4 Discrete Choice Experiment**

Discrete choice experiments (DCE) have been widely used in transportation and health economics (Greene and Hensher, 2003, Adamowicz, Louviere, and Williams, 1994), and in recent years labor economists began using them as an alternative to revealed preference methods employed to estimate compensating wage differentials (Mas and Pallais, 2017, Wiswall and Zafar, 2017). Their main advantage is that resemble how individuals maximize their utility in their everyday life, and how valuation of the attributes of interest would be carried out in a revealed preference framework. Many attributes can be varied at a time while keeping the task tractable for respondents.

In our choice experiment, individuals were first randomized into one of 10 blocks of 15 choice sets each. These choice sets contain two job offers each, which vary in one or more of the five characteristics mentioned before as well as their salary. For each choice set, individuals are asked

to pick their most preferred alternative, or no offer at all if they would reject both job offers. An example of such choice task is presented in Figure 4.

We use these choices to estimate the respondents’ WTP for each attribute using a mixed logit model (Revelt and Train, 1998, McFadden and Train, 2000). The use of this specification is possible since we observe multiple choices made by each respondent, which allows the parameters of interest to vary randomly across respondents. This permits us to obtain estimates of the parameters of interest for each individual as well as means for the entire sample. Moreover, the model does not require one to assume independence of irrelevant alternatives (IIA), which is unlikely to hold in a setting like this where jobs can vary in many dimensions.

### 3 Results

Our main results are presented in Table 3, where in columns 1 to 4 we present the estimates of each job attribute for every elicitation method. In addition to this, column 5 shows estimates for a random sample of one third of the DCE respondents, in order to use a sample size similar to the one we had for each of the other elicitation formats.

The first thing to notice is that estimates using the open-ended questions (column 1) are imprecise compared to those of other elicitation methods that have approximately the same sample size. Only four attributes seem to be valued by respondents: the need to travel 2 hours to work (for which individuals require EGP 268 as compensation, equivalent to 9.77% of the baseline wage), the provision of health insurance (for which they are willing to give up EGP 334 and 269 depending on whether only the worker or the worker and his/her spouse are covered, respectively), and the requirement to work on weekends (which requires an average compensation of EGP 330). Moreover, we cannot reject that the value of health insurance is independent of the individuals covered, something that seems counter-intuitive.

The reason for this is that the open-ended format does not set an upper bound on the wage that respondents can ask for the offers shown, so estimates are sensitive to the presence of outliers. Column 2 shows the results of estimating the amenities with a winsorized sample at the top 1%. Although still larger in magnitude than those from other elicitation methods, confidence intervals are smaller and all estimates are now statistically significant. Moreover, these estimates are robust

to winsorizing at various levels, as we show in Appendix Table A1.

In turn, according to the responses to they payment card questions (column 3), a job that is 90 minutes away from home should be paid on average EGP 126 (5.63%) more than one that is just 30 minutes away, while a 120-minute commute is priced at EGP 120 per month. Having to work on weekends requires an average compensation of EGP 132 (5.9% with respect to the baseline wage). On the other hand, respondents are willing to give up an average of EGP 109 (4.87%) to receive health insurance for themselves and EGP 82 (3.48%) if health insurance covers both the worker and his/her spouse. Similar to with the open-ended format, we cannot reject the hypothesis that the value of health insurance is the same regardless of who is covered.

Although more precise than those obtained from the open-ended format, payment card estimates are not robust to the range of values shown to respondents. In column 4, we estimated a model including an indicator that takes value 1 when the payment card shows “low” values (1000 to 2200EGP in 200EGP intervals) and 0 if the values are “high” (1400 to 2600EGP in 200EGP intervals), as well as interactions between this indicator and all the attributes. Estimates for certain attributes are different once we account for the different options shown to respondents, as is the case with commute time and health insurance.

Moreover, in Table B1 we present estimates for the payment card format using the full model including all the interaction terms between each attribute and the “low values” indicator. Even though the values in the middle are common to both payment cards used, those faced with a card with lower values tend to have an average reservation wage EGP 230 lower than those shown the card with higher values. Moreover, although we should not expect valuations for the different attributes to change with the choices given to respondents, some of these non-wage characteristics (health insurance and the availability of meals) are priced lower for individuals assigned the cards with lower values.

Estimates using a double-bound dichotomous choice format (column 3) point to a compensation of EGP 182, EGP 180 and EGP 192 for a job that is 60, 90 and 120 minutes away from home, respectively, compared to a baseline job that is 30 minutes away. Moreover, respondents are willing to work some weekends every month in exchange for an average wage increase of EGP 229 (11.22% with respect to baseline). On the other hand, they value health insurance for themselves at EGP 141, and health insurance for themselves and their spouse at EGP 255. Valuation for daycare

provided at workplace is marginally different from zero, but the sign is positive, which is at odds with what would be expected of an amenity.

Finally, according to the results of the discrete choice experiment (column 4), individuals are willing to take a job that is 60 instead of 30 minutes away from their home in exchange for a EGP 94 (or 5.13%) higher pay. Expected compensation for a job that is 90 and 120 minutes away from home stands at EGP 176 (9.6%) and EGP 256 (13.97%) respectively, suggesting that marginal disutility of travel time is increasing. In turn, respondents require an average compensation of EGP 120 (6.55%) for having to work some weekends each month.

On the other hand, respondents are willing to give up EGP 54 (2.95%) if their job includes health insurance for themselves, and EGP 145 (7.91%) if health insurance also covers their spouse. If their workplace provides them with meals they are willing to accept an EGP 82 (4.4%) lower salary, while having access to daycare at the workplace is priced at EGP 43 (2.35%).

Estimates using a one third random sample of the DCE respondents (in order to have a sample size similar to that of the other elicitation methods) show similar results for most characteristics than those of the full sample, although estimates are less precise.

In summary, the results shown so far demonstrate that the method used to elicit workers' preferences (and in particular, valuation) for any set of job characteristics is quite relevant when analyzing the results obtained. This is particularly relevant for the case of the open-ended format, since it the most commonly method used in labor force surveys that include this type of question, but as we could observe is the one that yield the most imprecise estimates. Similarly, estimates from the payment card format are not robust to changes in the extremes of options given to respondents. Moreover, in both cases the sign of some estimates seem at odds with economic theory, with individuals requiring a wage premium to receive an amenity.

Ideally, a comparison with estimates obtained experimentally through a revealed-preference method should be carried out in order to determine whether any of these (or other) elicitation methods can be confidently used. Unfortunately to our knowledge all current studies use only one of these approaches, and those that intend to make this comparison are limited to comparing a stated-preference approach to the characteristics of the worker's current employment (Maestas et al., 2018).

Another potential source of concern is whether responses depend on the baseline scenario shown

to respondents, for a given set of characteristics. We test this by changing the baseline scenario shown to respondents in all but the discrete choice experiment.

Some individuals were assigned a first job offer that does not include health insurance, and the second and third offers added this amenity for themselves and their spouses, respectively. Another group of respondents faced a first job offer that included health insurance for themselves and their spouse, and the following two offers progressively removed the number of people covered by this amenity. No other job characteristic of the pool that we tested was included in these offers.

We use the responses of to these three offers to test whether the order in which amenities appear influence the value given to them. For this, in each model we estimate we include a dummy that takes value 1 for individuals assigned to the offers that start with no health insurance and progressively adds coverage, and interaction between this “treatment” variable and each type of health insurance coverage.

The results are shown in Table 4. The indicator for the order in which attributes appear are not statistically different from zero, suggesting that the order does not alter the wage choices of responses. Moreover, interactions between this treatment dummy and health insurance coverage are for the most part also indistinguishable from zero. The only exception is the interaction between the treatment dummy and the inclusion of health insurance for the worker and her spouse in the double-bound dichotomous choice elicitation format, which is nevertheless only marginally significant.

## 4 Treatment effect heterogeneity

In the previous section we showed that estimates vary substantially depending on the elicitation method used. Here, we also study whether individuals with different observable characteristics have different valuations for these non-wage job attributes conditional on the elicitation method used. We identified four characteristics that might influence individual’s valuation for some or all of the attributes used in our experiment: gender, marital status (whether the respondent is married or not), level of education (whether the person has higher education) and amount of time spent looking for a job (more or less than the average unemployment spell length in our sample of 9.8 months).

## 4.1 Gender differences in attribute valuations

Table 5 presents the estimates of attribute valuations for men and women separately. Approximately 2.5 men answered our survey for each woman who responded, so confidence intervals for women tend to be larger.

Looking at the results from the open-ended elicitation format (where we winsorized responses at the top 1%), we do not find that estimates of the valuation of attribute are statistically different between men and women. However, for some attributes it can be observed that point estimates are different by EGP 50-100, which may indicate that our inability to reject these differences is due to the combination of small sample size and large confidence intervals produced by this elicitation method. Interestingly, we find that men’s reservation wages are approximately EGP 150 lower when the baseline specification does not include health insurance.

Results from the payment card format yield similar results in terms of gender differences whereby most estimates are statistically equal between men and women even though for some attributes the point estimates are quite different. As with the open-ended questions, men tend to ask for a lower salary when the baseline job does not include health insurance. Importantly, it seems that even though men and women reduce their valuation for health insurance and the provision of meals at the workplace by a similar amount when the options for possible wages are in a lower range, men have a much lower overall asking salary under this scenario.

From the estimates of the double-bound dichotomous choice format, it seems that men value health insurance coverage for them and their spouse significantly more than women. This result could be explained by the large difference in labor force participation between men and women. Women might not be interested in health insurance covering their spouses if they already receive coverage through their own employment. On the other hand, women seem to have a much larger disutility for working on weekends, as their required compensation is about twice as large as that required by men. Also, similar to what is observed in the other elicitation methods, reservation wages tend to be lower for men than for women when the baseline job does not include health insurance.

Although we do not formally test the equality of coefficients obtained in the discrete choice experiment, we can observe large differences across gender for most of the job characteristics analyzed.

Women tend to value proximity to the workplace more than men, as well as not having to work on weekends and having access to in-site daycare. In contrast, they seem to assign a lower value to health insurance, whether it is only for them or it also covers their spouse.

## 4.2 Heterogeneity by marital status

Table 6 show our results separately between married and single (which includes divorced and widow) individuals. Because this information was obtained from NEP’s records and we were not able to match all our survey respondents to their own database, sample sizes are smaller. This means that even though point estimates can differ by hundreds of pounds, in some cases we do not have enough power to detect a statistically significant difference, as is the case with results from the payment card responses. However, we are still able to observe differences by marital status for other elicitation methods in some characteristics.

Among respondents to the open-ended questions, married individuals show a larger disutility from working on weekends than single respondent, which might indicate that the value of this disamenity depends on household composition. Surprisingly, the results observed in Table 3 regarding the value assigned to the provision of meals and daycare at the workplace, which have the incorrect sign, are driven by married individuals.

Regarding the dichotomous choice questions, we find that estimates for travel time are similar for married and single respondents with the exception of a 2-hour commute, which single individuals value significantly more. On the other hand, and as one would expect married people value health insurance (both for themselves and their spouses) more than twice as much as respondents who are single.

## 4.3 Heterogeneity by level of education

Similar to what happens when we split the sample by marital status, sample sizes are small when we condition on level of education (where we consider “high education” any study above secondary school), and we are not able to find many differences in how individuals value the job attributes we analyze. The exceptions to this are in the open-ended format for health insurance (where highly educated individuals show a higher willingness to pay in order to receive this benefit) and the requirement to work on weekends (for which low educated individuals require a lower compensation).

Similar differences in the compensation required to work on Fridays are also observed in the double-bound dichotomous choice format, as well as in travel time (both for a 90 and a 120-minute commute) which is valued significantly more by highly educated respondents.

#### **4.4 Heterogeneity by time on job search**

We conclude our analysis by looking at whether the value assigned at the job characteristics vary by the time the person had spent looking for a job when they filled our survey. Even though we cannot be sure that these individuals are unemployed, we classify them between long and short-term unemployed based on the average search spell in our sample, which is 9.8 months.

While we do not observe differences in valuations for the payment card or discrete choice elicitations, we find that according to the responses of open-ended questions, those looking for a job for longer than average require a larger compensation for having to travel 2 hours to work than the short-term unemployed. The opposite result is observed for a 60-minute commute to work in the double-bound dichotomous choice.

The other differences we find across these groups are related to health insurance, for which (according to the results from the open-ended format) long-term unemployed individuals are willing to give up a larger amount of their wage, and the need to work on weekends, a disamenity valued more by the short-term unemployed among those assigned to the double-bound dichotomous choice.

Even though one would expect lower valuations of job characteristics by individuals who have been looking for a job for a longer period of time, it is important to note that this group constitutes a selected sample. Indeed, individuals may be unemployed for a long time as a consequence of the high value they assign to non-wage characteristics. A longitudinal study of attribute valuation would shed light on this issue.

## **5 Conclusion**

Non-wage job amenities constitute a considerable part of worker's compensation in many jobs. If workers value these amenities more than what it cost to provide them, these amenities are a way for firms to attract workers and reduce the cost of a vacancy. However, estimating the value that workers assign to job characteristics has proven challenging.



The first attempts to estimate workers' willingness to pay for job amenities have used a revealed preference approach relying on observational data. Because this approach fails to control for the worker's entire choice set of jobs, economists have recently turned to stated preference methods that elicit willingness to pay in hypothetical scenarios controlled by the researcher. Nevertheless, it is unclear how estimates derived from different elicitation methods compare with each other nor why one should be preferred over others.

In this paper, we aim to fill this gap by comparing estimates from different methods to value the same non-wage characteristics among job seekers in Egypt. Respondents were randomly assigned to one of three elicitation formats to estimate their willingness to pay/accept compensation for five different job attributes: distance to work, health insurance coverage, weekend shifts, and the provision of daycare and meals at the workplace. In addition to this, all respondents were asked to complete a discrete choice experiment (the most common approach used in recent years among labor economists) consisting of several pairwise comparisons of job offers that varied across these five characteristics.

We find large differences in the estimates obtained with the different elicitation methods, both in nominal terms and with respect to a "baseline wage" that corresponds to a job with no amenities and 30 minutes away from the worker's home. For example, the estimate of willingness to pay for health insurance coverage among individuals assigned to the double-bound dichotomous choice format is EGP 146, or 7% of the baseline wage, while the estimate of willingness to pay based on the DCE is EGP 54, or 2.9% of the baseline salary.

Because of these sizable differences, it is important to have a better understanding of which elicitation methods are able to better approximate true valuations. Hence, it is important that future research focuses on validating estimates obtained from stated preference methods with those from revealed preference approaches in controlled environments.

From our results it seems that certain elicitation formats should be avoided. For example, estimates obtained from open-ended questions (which are popular in household or labor force surveys) are sensitive to the presence of outliers. Even after taking this factor into account, we observe that estimates for certain amenities have the opposite sign from what theory predicts. This may be indicative of either issues related to incentive compatibility of the method or lack of understanding by respondents.

In addition to this, estimates obtained with the payment card format are not robust to the range of options shown to respondents. We observe not only differences in baseline wages but also changes in the value assigned to certain attributes depending on the values shown at the bottom or the top of the distribution of wages offered.

Besides differences in valuations by elicitation method, we also observe heterogeneity in willingness to pay within method across different demographics, such as gender and level of education. These differences could be of interest for firms at the time of deciding compensation packages for different occupations and/or individuals, and it might help explain part of the wage disparities found in non-experimental data.

Interestingly, we also find few differences in attribute valuation across length of job search spell. While the reason for this may be that individuals who have spent a long time looking for a job are a selected sample among job seekers, it also suggests that interventions aimed at “correcting” the expectations of these individuals could help them reduce the time it takes for them to find a job.

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Figure 1: Example of open-ended question asked to respondents

Elicitation questions > Open-ended questions

Suppose you were offered a job today that requires you to work from 9-5 on weekdays, it is 30 minutes away from your home, does not include health insurance, does not include meals and does not have childcare facilities on site. What is the lowest wage or salary you would accept for this type of job?

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Figure 2: Example of payment card question asked to respondents

Elicitation questions > Payment card questions

Suppose you were offered a job today that requires you to work from 9-5 on weekdays, it is 30 minutes away from your home, does not include health insurance, does not include meals and does not have childcare facilities on site. What is the lowest wage or salary you would accept for this type of job?

☐ 1400 EGP

☐ 1600 EGP

☐ 1800 EGP

☐ 2000 EGP

☐ 2200 EGP

☐ 2400 EGP

☐ 2600 EGP

☐ More than 2600 EGP

Figure 3: Example of double-bound dichotomous choice question asked to respondents

Elicitation questions > Double-bounded dichotomous choice questions

Suppose you were offered a job today that requires you to work from 9-5 on weekdays, it is 30 minutes away from your home, does not include health insurance, does not include meals and does not have childcare facilities on site.

Would you accept it if it paid 2400 for this job?

☐ Yes

☐ No

Figure 4: Example of discrete choice question asked to respondents

Elicitation questions > Discrete choice experiment questions

Suppose you are offered two job offers with the characteristics described below. Which, if any, would you accept?

Job offer A	Job offer B
Your salary would be EGP 1200 per month	Your salary would be EGP 1800 per month
You have to travel 30 minutes every day to get to work	You have to travel 120 minutes every day to get to work
You would not be provided with health insurance	You would be provided health insurance for yourself
You would be asked to work some Fridays every month	You would only work on weekdays
Meals will be provided at the workplace	No meals will be provided
Childcare is available on site	No childcare is available on site

☐ Job offer A

☐ Job offer B

☐ None of the job offers

Table 1: Job characteristics and their levels

Attribute	Levels
Commute time (one-way)	30 minutes
	60 minutes
	90 minutes
	120 minutes
Included health insurance	No
	For the worker
	For the worker and spouse
Need to work on weekends	No
	Some weekends
Meals provided	No
	Yes
In-site daycare	No
	Yes

*Note:* This table shows the different job attributes that could vary in the hypothetical job offers presented to a respondent. Except in the case of the Discrete Choice Experiment, only one job attribute was varied at a time with each offer shown.

Table 2: Summary statistics of survey respondents and comparison with 2017 Labor Force Survey

<i>Panel A: NEP Sample</i>	All			Men			Women		
	Mean	SD	N	Mean	SD	N	Mean	SD	N
Age	26.85	6.26	1856	27.50	6.34	1302	25.31	5.78	554
Share male	0.70	0.46	1895						
Share married	0.29	0.45	1318	0.30	0.46	922	0.28	0.45	396
Years of education	12.84	4.02	1318	12.77	3.96	922	13.02	4.14	396
Previous Work Status									
Unemployment spell (months)	9.79	19.03	1383	9.51	19.12	950	10.39	18.84	433
Hours spent last week looking for a job	20.42	20.33	1612	21.67	20.83	1124	17.54	18.86	488
Hours spent on average looking for a job	14.33	15.88	1612	15.79	16.82	1124	10.95	12.85	488
Numbers of methods used to look for a job	1.73	1.57	1895	1.71	1.61	1331	1.76	1.48	564
<hr/>									
<i>Panel B: 2017 Labor Force Survey</i>	All			Men			Women		
	Mean	SD	N	Mean	SD	N	Mean	SD	N
Age	27.24	7.63	9541	25.87	7.60	5039	28.77	7.37	4502
Share male	0.53	0.50	9541						
Share married	0.31	0.46	9541	0.14	0.35	5039	0.50	0.50	4502
Years of education	12.41	4.06	9541	11.80	4.49	5039	13.10	3.39	4502
Unemployment spell (months)	35.72	38.68	9541	23.62	25.6	5039	49.25	45.71	4502
Numbers of methods used to look for a job	2.23	1.31	9541	2.31	1.32	5039	2.14	1.30	4502

*Note:* Panel A shows the mean and standard deviation for demographic characteristics and job search behavior of the respondents. Sample size for each characteristic vary depending on our ability to match data from our respondents to that collected by our partner NGO. Panel B presents the corresponding demographic characteristics and search behavior (if available) according to unemployed individuals in the 2017 Labor Force Survey. Hours spent looking for a job and unemployment spell variables winsorized at the bottom and top 5%.



Table 3: Results of different elicitation formats

	Open Ended (1)	Open Ended Winsorized (2)	Pay Card (3)	Pay Card (4)	Double Bound (5)	DCE (6)	DCE (1/3 sample) (7)
Commute Time (60 Minutes)	160.75 (132.30)	192.61*** (58.49)	31.70 (30.31)	40.06 (41.84)	181.09*** (53.35)	93.87*** (19.42)	49.5 (38.68)
Commute Time (90 Minutes)	152.75 (112.67)	286.75*** (63.36)	126.34*** (33.18)	164.74*** (46.74)	183.22*** (54.06)	176.44*** (24.58)	52.5 (61.63)
Commute Time (120 Minutes)	266.63** (114.66)	384.21*** (65.77)	120.16*** (29.32)	64.62* (37.15)	191.94*** (54.52)	256.23*** (26.04)	252.21*** (55.27)
Health Insurance for Self	-335.14*** (99.40)	-168.11*** (24.30)	-109.64*** (10.37)	-141.75*** (14.75)	-146.54*** (37.79)	-54.57*** (16.76)	-6.6 (26.17)
Health Insurance for Self & Spouse	-270.41*** (68.50)	-201.10*** (24.26)	-82.03*** (10.90)	-90.31*** (14.78)	-259.46*** (29.58)	-145.52*** (17.76)	-159.96*** (26.84)
Need to Work on Friday	329.05*** (117.71)	333.08*** (28.67)	132.10*** (13.10)	138.26*** (18.04)	230.67*** (35.26)	120.28*** (13.77)	138.52*** (21.44)
Meals provided at workplace	6.66 (94.13)	80.36*** (26.19)	24.26** (12.30)	-18.36 (16.04)	-11.07 (34.24)	-82.64*** (12.44)	-82.15*** (21.22)
Daycare provided at workplace	-63.18 (83.04)	72.81*** (25.99)	-0.17 (12.78)	-9.94 (18.05)	62.27* (34.43)	-43.23*** (12.77)	-36.41* (20.63)
Baseline offer does not include HI	-45.14 (91.00)	-112.28* (65.05)	-23.74 (33.86)	16.23 (47.21)	-43.39 (27.25)		
Wage at baseline (EGP)	2744	2532	2237	2237	2042	1833	1850
Observations	4270	4270	4431	4431	4354	28005	9330
Number of Individuals	610	610	633	633	622	1867	622

Note: Open-ended estimates were obtained by regressing the stated wage on indicators for each of the characteristics specified. Payment card estimates were obtained by maximum likelihood where the dependent variable is the interval between the value chosen and the closest value available below the one chosen. The estimates from column 3 were obtained in a model where all characteristics are interacted with a dummy that takes value 1 if the payment card shows a range of lower values. Double bound estimates were obtained by maximum likelihood using the intervals provided by the Yes/No answers to each job offer given by the respondent. DCE estimates were obtained using a mixed logit model in the willingness to pay space estimated by maximum likelihood. Estimates for the winsorized open-ended format obtained by winsorizing at the top 1% of responses. Baseline wage corresponds to average salary when the job is 30 minutes away from the respondent's home and no other attribute is included. Standard errors clustered at the individual level between parenthesis.  
\*\*\* p<0.01, \*\* p<0.05, \*p<0.1

Table 4: Sensitivity of Responses Based on Randomized First Question in Series

	Open Ended (1)	Pay Card (2)	Double Bound (3)
Health Insurance for Self * Treatment	-185.16 (306.72)	4.09 (17.68)	-112.91 (76.98)
Health Insurance for Self & Spouse * Treatment	-135.92 (342.40)	-13.98 (19.81)	138.36* (75.72)
Health Insurance for Self	-227.12*** (74.40)	-98.19*** (12.66)	-115.49** (54.37)
Health Insurance for Self & Spouse	-175.27* (101.48)	-60.12*** (13.71)	-379.26*** (52.96)
Treatment	39.81 (334.47)	-17.02 (32.83)	-18.79 (55.28)
Observations	1827	1908	1860
Number of Individuals	609	636	620

*Note:* The table shows estimates from the open ended, pay card and double bound dichotomous choice depending on whether the baseline (first) job shown includes health insurance for the respondent and her spouse. Standard errors clustered at the individual level between parenthesis.

\*\*\* p<0.01, \*\* p<0.05, \*p<0.1

Table 5: Treatment effect heterogeneity by gender

	Open Ended			Pay Card			Double Bound			DCE	
	Men	Women	P-value of difference	Men	Women	P-value of difference	Men	Women	P-value of difference	Men	Women
Commute Time (60 Minutes)	179.56*** (68.34)	209.11** (103.60)	0.81	78.9 (48.00)	7.67 (66.64)	0.46	158.43** (64.67)	211.09** (92.83)	0.60	87.11*** (21.22)	184.25*** (67.55)
Commute Time (90 Minutes)	321.90*** (77.27)	245.17*** (101.89)	0.55	166.54*** (58.56)	207.20*** (70.79)	0.71	182.47*** (68.62)	211.63** (86.20)	0.76	133.79*** (18.16)	303.10*** (63.51)
Commute Time (120 Minutes)	402.51*** (77.20)	308.11*** (113.85)	0.49	38.4 (38.20)	42.68 (82.88)	0.97	169.56** (66.20)	221.08** (93.97)	0.65	228.40*** (24.75)	368.15*** (69.81)
Health Insurance for Self	-171.26*** (31.35)	-160.02*** (32.61)	0.80	-152.84*** (18.33)	-115.91*** (24.16)	0.61	-129.17*** (46.87)	-181.73*** (63.59)	0.31	-67.46*** (14.95)	-10.4 (29.92)
Health Insurance for Self & Spouse	-215.26*** (29.62)	-164.72*** (41.72)	0.32	-106.95*** (17.16)	-49.00* (28.38)	0.29	-308.72*** (36.60)	-175.83*** (49.78)	0.01	-143.79*** (29.06)	-68.47*** (29.65)
Need to Work on Friday	313.08*** (34.17)	383.72*** (52.73)	0.26	127.13*** (20.40)	156.75*** (36.54)	0.66	172.93*** (43.09)	342.71*** (60.00)	0.00	102.21*** (15.08)	173.85*** (25.07)
Meals provided at workplace	76.21** (33.19)	90.34** (38.49)	0.78	-21.0 (19.23)	-14.87 (29.78)	0.93	-29.3 (41.83)	20.1 (58.56)	0.33	-68.32*** (13.52)	-85.16*** (29.68)
Daycare provided at workplace	63.51* (33.26)	96.01*** (36.28)	0.51	-24.3 (22.16)	21.66 (30.20)	0.48	43.9 (42.24)	97.79* (58.38)	0.33	-30.87** (13.65)	-82.83*** (30.70)
Baseline offer does not include HI	-155.13** (75.29)	-28.36 (113.32)	0.35	-26.3 (51.54)	112.49 (81.52)	0.01	-104.32*** (33.75)	59.5 (45.98)	0.07		
Wage at baseline (EGP)	2661	2200		2348	1982		2157	1810		1918	1503
Observations	3073	1197		3101	1330		3010	1344		19680	8325
Number of Individuals	439	171		443	190		430	192		1312	555

*Note:* The table shows estimates of the value for each job characteristic by elicitation method used, for men and women separately. Open-ended estimates correspond to estimates of the winsorized sample at the top 1%. Payment card estimates correspond to the specification in which each attribute is interacted with a dummy that takes value 1 if the payment card shows a range of lower values. Baseline wage corresponds to average salary when the job is 30 minutes away from the respondent's home and no other attribute is included. Standard errors clustered at the individual level between parenthesis.  
\*\*\* p<0.01, \*\* p<0.05, \*p<0.1

Table 6: Treatment effect heterogeneity by marital status

	Open Ended			Pay Card			Double Bound			DCE		
	Married	Single	P-value of difference	Married	Single	P-value of difference	Married	Single	P-value of difference	Married	Single	P-value of difference
Commute Time (60 Minutes)	183.71 (153.72)	277.78*** (80.86)	0.59	-83.4 (80.49)	46.64 (64.80)	0.30	266.42** (126.71)	158.55** (79.23)	0.40	83.18*** (24.85)	62.89** (27.61)	
Commute Time (90 Minutes)	467.81*** (158.29)	220.83*** (79.45)	0.16	10.2 (103.53)	252.95*** (62.77)	0.10	269.78** (125.88)	120.8 (75.31)	0.28	179.10*** (37.35)	127.52*** (37.63)	
Commute Time (120 Minutes)	420.45*** (135.89)	361.12*** (89.81)	0.71	152.5 (93.68)	7.68 (52.85)	0.24	-51.0 (122.77)	276.68*** (75.16)	0.01	209.94*** (32.02)	185.00*** (36.58)	
Health Insurance for Self	-142.55*** (51.41)	-181.94*** (35.08)	0.52	-220.30*** (41.37)	-138.21*** (20.11)	0.39	-262.84*** (89.26)	-126.27** (53.48)	0.08	-113.43*** (27.32)	-76.55*** (19.35)	
Health Insurance for Self & Spouse	-230.10*** (56.00)	-218.98*** (32.62)	0.86	-166.91*** (38.98)	-75.43*** (19.88)	0.21	-495.51*** (70.57)	-217.08*** (41.74)	0.00	-209.40*** (30.50)	-160.59*** (21.95)	
Need to Work on Friday	484.06*** (57.77)	299.40*** (40.71)	0.01	120.03*** (45.09)	143.52*** (24.69)	0.78	163.23** (81.39)	232.27*** (49.65)	0.33	107.30*** (25.56)	145.00*** (18.65)	
Meals provided at workplace	183.08*** (64.51)	42.13 (36.05)	0.05	-45.1 (40.07)	-33.79 (22.40)	0.89	-30.7 (78.77)	-5.4 (48.68)	0.70	-104.65*** (24.17)	-100.35*** (16.10)	
Daycare provided at workplace	175.94*** (56.20)	36.75 (35.42)	0.04	-55.2 (38.84)	-15.63 (27.86)	0.64	-0.9 (79.26)	96.15* (49.06)	0.16	7.6 (22.53)	-47.01*** (13.91)	
Baseline offer does not include HI	-125.11 (146.25)	-147.35 (89.31)	0.90	-37.7 (107.23)	38.04 (67.61)	0.26	-157.44** (64.62)	24.4 (38.54)	0.12			
Wage at baseline (EGP)	2515	2550		2404	2182		2216	1981		1926	1811	
Observations	924	2121		854	2261		861	2121		5670	13935	
Number of Individuals	132	303		122	323		123	303		378	929	

Note: The table shows estimates of the value for each job characteristic by elicitation method used, for married and single respondents separately. Open-ended estimates correspond to estimates of the winsorized sample at the top 1%. Payment card estimates correspond to the specification in which each attribute is interacted with a dummy that takes value 1 if the payment card shows a range of lower values. Baseline wage corresponds to average salary when the job is 30 minutes away from the respondent's home and no other attribute is included. Standard errors clustered at the individual level between parenthesis.  
\*\*\* p<0.01, \*\* p<0.05, \*p<0.1

Table 7: Treatment effect heterogeneity by level of education

	Open Ended			Pay Card			Double Bound			DCE		
	Tertiary education	High school or less	P-value difference	Tertiary education	High school or less	P-value difference	Tertiary education	High school or less	P-value difference	Tertiary education	High school or less	P-value difference
Commute Time (60 Minutes)	408.58*** (123.31)	177.17** (89.15)	0.13	21.1 (83.41)	9.08 (63.57)	0.93	132.2 (132.65)	202.67*** (77.87)	0.60	118.04* (69.71)	130.69*** (34.08)	
Commute Time (90 Minutes)	245.29** (108.88)	325.63*** (93.43)	0.57	172.16** (69.18)	182.06** (80.22)	0.94	285.38*** (110.59)	96.7 (79.33)	0.10	270.78*** (54.98)	170.64*** (42.60)	
Commute Time (120 Minutes)	397.93*** (122.44)	342.11*** (92.35)	0.71	104.5 (76.85)	7.70 (57.36)	0.40	411.27*** (106.60)	53.0 (81.12)	0.01	367.78*** (80.00)	248.18*** (28.90)	
Health Insurance for Self	-248.88*** (48.39)	-126.42*** (36.33)	0.04	-161.86*** (26.19)	-158.52*** (25.34)	0.97	-159.30** (78.98)	-158.77*** (56.24)	0.99	-85.66*** (29.22)	-47.73** (23.32)	
Health Insurance for Self & Spouse	-332.10*** (45.90)	-164.85*** (36.48)	0.00	-77.77*** (25.57)	-116.08*** (24.46)	0.57	-289.48*** (61.85)	-288.01*** (44.01)	0.98	-186.72*** (35.65)	-157.98*** (24.24)	
Need to Work on Friday	428.28*** (55.21)	311.17*** (42.22)	0.09	170.08*** (34.70)	113.54*** (28.45)	0.48	359.19*** (73.75)	138.80*** (51.87)	0.00	229.77*** (48.21)	132.57*** (19.22)	
Meals provided at workplace	82.44* (49.60)	87.10** (41.90)	0.94	-11.8 (29.51)	-55.02** (25.99)	0.58	38.0 (71.59)	-35.3 (50.76)	0.23	-48.48** (23.66)	-83.88*** (16.12)	
Daycare provided at workplace	36.66 (48.00)	105.79*** (38.89)	0.26	-15.7 (37.84)	-34.55 (28.46)	0.81	127.19* (71.74)	40.9 (51.32)	0.18	-40.3 (33.38)	-65.01*** (20.30)	
Wage at baseline (EGP)	2718	2428		2236	2237		2031	2059		1753	1815	
Observations	1162	1883		1267	1848		1029	1953		7425	12180	
Number of Individuals	166	269		181	264		147	279		495	812	

Note: The table shows estimates of the value for each job characteristic by elicitation method used, for respondents with tertiary education and high school or less, separately. Open-ended estimates correspond to estimate the winsorized sample at the top 1%. Payment card estimates correspond to the specification in which each attribute is interacted with a dummy that takes value 1 if the payment card shows a range of lower values. Baseline wage corresponds to average salary when the job is 30 minutes away from the respondent's home and no other attribute is included. Standard errors clustered at the individual level between parenthesis.  
\*\*\* p<0.01, \*\* p<0.05, \*p<0.1

Table 8: Treatment effect heterogeneity by time searching for a job

	Open Ended			Pay Card			Double Bound			DCE	
	Long-term unemployed	Short-term unemployed	P-value difference	Long-term unemployed	Short-term unemployed	P-value difference	Long-term unemployed	Short-term unemployed	P-value difference	Long-term unemployed	Short-term unemployed
Commute Time (60 Minutes)	140.49 (85.17)	232.75*** (80.43)	0.43	-48.4 (61.23)	109.15* (56.56)	0.11	57.2 (78.30)	288.84*** (72.79)	0.01	99.30** (42.16)	132.92** (51.76)
Commute Time (90 Minutes)	190.74* (106.90)	352.12*** (76.01)	0.22	82.9 (73.99)	222.19*** (59.00)	0.22	170.99** (84.64)	190.02*** (70.06)	0.85	201.31*** (36.36)	171.97*** (31.31)
Commute Time (120 Minutes)	497.53*** (96.49)	275.42*** (88.09)	0.09	79.7 (57.82)	55.60 (48.18)	0.79	214.80*** (78.49)	169.98** (75.49)	0.67	254.86*** (34.35)	311.02*** (63.00)
Health Insurance for Self	-215.93*** (39.55)	-126.65*** (29.68)	0.07	-157.46*** (26.70)	-130.81*** (16.65)	0.71	-162.33*** (56.04)	-131.28** (50.97)	0.53	-55.72*** (15.77)	-66.74* (40.12)
Health Insurance for Self & Spouse	-258.67*** (38.09)	-150.05*** (30.49)	0.03	-73.83*** (22.93)	-102.76*** (19.28)	0.60	-275.13*** (43.96)	-243.58*** (39.88)	0.52	-135.37*** (23.66)	-144.48*** (53.40)
Need to Work on Friday	337.16*** (46.90)	326.52*** (34.94)	0.86	110.98*** (28.64)	158.81*** (23.14)	0.46	165.71*** (52.03)	285.20*** (47.77)	0.02	103.82*** (19.44)	131.95*** (17.21)
Meals provided at workplace	88.41** (43.50)	70.48** (31.40)	0.74	-9.7 (28.35)	-23.78 (18.64)	0.83	-15.2 (51.07)	-7.0 (45.96)	0.87	-72.22*** (16.73)	-71.07*** (21.78)
Daycare provided at workplace	98.59** (44.88)	48.09 (29.37)	0.34	-28.5 (32.69)	3.43 (20.36)	0.62	68.4 (51.45)	57.8 (46.16)	0.83	-36.23** (16.32)	-32.1 (49.29)
Wage at baseline (EGP)	2537	2527		2259	2224		2033	2049		1811	1781
Observations	1946	2324		1778	2653		2016	2338		12315	15690
Number of Individuals	278	332		254	379		288	334		821	1046

*Note:* The table shows estimates of the value for each job characteristic by elicitation method used, for individuals who have spent more or less time searching for a job than the average respondent, respectively. Open correspond to estimates of the winsorized sample at the top 1%. Payment card estimates correspond to the specification in which each attribute is interacted with a dummy that takes value 1 if the payment card shows values. Baseline wage corresponds to average salary when the job is 30 minutes away from the respondent's home and no other attribute is included. Standard errors clustered at the individual level between parenthesis. \*\*\* p<0.01, \*\* p<0.05, \*p<0.1

## Appendix A Estimates of elicitation via open-ended questions - Winsorized responses

The following table presents the estimates of values implied by individual's responses among those assigned to the open-ended format. Columns 1 and 2 replicate the estimates shown in Table 3, where responses are not winsorized and winsorized at the top 1%, respectively. In turn, columns 3 and 4 show the results when responses are winsorized at the top 2% and 5%, respectively. We can reject at the 1% level the null hypothesis that the estimates are statistically equivalent across models.

Table A1: Estimates of Open-Ended elicitation with winsorized values

Cutoff	0%	1%	2%	5%
	(1)	(2)	(3)	(4)
Commute Time (60 Minutes)	161.02 (133.23)	192.75*** (58.79)	188.90*** (55.34)	179.87*** (43.45)
Commute Time (90 Minutes)	148.41 (112.83)	283.17*** (63.11)	281.61*** (60.10)	244.61*** (48.48)
Commute Time (120 Minutes)	268.17** (114.82)	386.21*** (65.69)	360.75*** (60.17)	288.54*** (47.52)
Health Insurance for Self	-334.29*** (99.87)	-166.83*** (24.32)	-158.91*** (23.21)	-133.38*** (16.35)
Health Insurance for Self & Spouse	-269.53*** (68.79)	-199.76*** (24.31)	-193.28*** (22.80)	-168.49*** (17.35)
Need to Work on Friday	330.47*** (117.96)	335.06*** (28.67)	324.79*** (26.60)	284.79*** (19.68)
Meals provided at workplace	4.11 (94.42)	78.52*** (26.25)	76.75*** (24.71)	69.83*** (17.68)
Daycare provided at workplace	-62.40 (83.44)	74.40*** (26.13)	76.72*** (24.89)	71.37*** (18.63)
P-value of equality of coefficients	.000			
Wage at baseline (EGP)	2743	2531	2521	2533
Observations	4263	4263	4263	4263
Number of Individuals	609	609	609	609

*Note:* The table shows estimates from the open ended elicitation when responses are winsorized at the 1, 2 and 5% of the top of the distribution. Baseline wage corresponds to average salary when the job is 30 minutes away from the respondent's home and no other attribute is included. Standard errors clustered at the individual level between parenthesis.

\*\*\* p<0.01, \*\* p<0.05, \*p<0.1

## Appendix B    Payment card estimates

The following table presents estimates for the values of different job attributes among individuals assigned to the payment card format for different specifications and estimation methods. Column 1 shows the maximum likelihood estimates of from the payment card elicitation without considering differences by the range of options shown to respondents. Column 2 shows maximum likelihood estimates including an interaction between each attribute and an indicator that takes value 1 when the distribution of options shown to respondents is shifted to the left. Columns 3 and 4 replicate the model of column 2 by OLS when the dependent variable is the value chosen by the individual and the midpoint between the wage chosen and the next lowest value.



Table B1: Comparison of estimates for Payment card format

	Base model (1)	Full model (2)	Chosen value (2)	Midpoint (3)
Commute Time (60 Minutes)	31.70 (30.31)	40.06 (41.84)	14.86 (35.34)	40.74 (38.91)
Commute Time (90 Minutes)	126.34*** (33.18)	164.74*** (46.74)	121.41*** (36.03)	149.51*** (42.19)
Commute Time (120 Minutes)	120.16*** (29.32)	64.62* (37.15)	45.68 (31.59)	52.25 (37.04)
Health Insurance for Self	-109.64*** (10.37)	-141.75*** (14.75)	-134.29*** (13.27)	-137.24*** (15.54)
Health Insurance for Self & Spouse	-82.03*** (10.90)	-90.31*** (14.78)	-76.03*** (13.15)	-85.03*** (16.48)
Need to Work on Friday	132.10*** (13.10)	138.26*** (18.04)	118.06*** (15.38)	134.97*** (18.61)
Meals provided at workplace	24.26** (12.30)	-18.36 (16.04)	-31.32** (14.21)	-24.66 (16.45)
Daycare provided at workplace	-0.17 (12.78)	-9.94 (18.05)	-23.24 (15.87)	-9.75 (18.11)
Baseline offer does not include HI	-23.74 (33.86)	16.23 (47.21)	12.21 (41.66)	18.20 (47.83)
Lower card values		-230.91*** (48.33)	-251.99*** (41.45)	-228.59*** (47.65)
60-Minute commute x Low card values		-19.66 (56.98)	2.09 (47.34)	-21.25 (52.30)
90-Minute commute x Low card values		-55.52 (61.89)	-39.32 (47.15)	-56.71 (54.58)
120-Minute commute x Low card values		90.30 (56.49)	65.92 (43.06)	75.57 (50.66)
Health insurance for self x Lower card values		73.23*** (19.66)	80.18*** (16.81)	74.62*** (19.52)
Health insurance for self and spouse x Lower card values		23.27 (20.86)	24.08 (17.55)	24.74 (21.12)
Need to work on Friday x Lower card values		-24.32 (24.94)	-32.48 (20.12)	-35.20 (23.68)
Meals x Lower card values		85.54*** (23.44)	84.42*** (19.39)	83.27*** (22.46)
Daycare x Lower card values		21.23 (24.65)	32.62 (20.94)	18.85 (24.04)
Wage at baseline	2237	2237	2290	2213
Observations	4431	4431	4431	4431
Number of Individuals	633	633	633	633

*Note:* Column 1 shows the maximum likelihood estimates of from the payment card elicitation without considering differences by the range of options shown to respondents. Column 2 shows maximum likelihood estimates including an interaction between each attribute and an indicator that takes value 1 when the distribution of options shown to respondents is shifted to the left. Columns 3 and 4 replicate the model of column 2 by OLS when the dependent variable is the value chosen by the individual and the midpoint between the wage chosen and the next lowest value. Baseline wage corresponds to average salary when the job is 30 minutes away from the respondent's home and no other attribute is included. Standard errors clustered at the individual level between parenthesis.

\*\*\* p<0.01, \*\* p<0.05, \*p<0.1