To be hired or not to be hired, the employer decides : relative chances of unemployed job-seekers on the Dutch labor market

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APPENDIX A AUXILIARY PARAMETERS AND SIGNIFICANCE TESTS

The model on which the main results of this study are based, contains a set of auxiliary variables. The model is described by equation (4.4) in section 4.3. The estimation results for the explanatory variables were presented in table 5.3 of section 5.3.2. The estimation results are treated separately for reasons of clarity. All coefficients for the preference model were estimated simultaneously in a single maximum likelihood procedure. Sections A.1 and A.2 concentrate on the auxiliary parameters, while section A.3 focusses on the significance tests for the model.

In order to get a good grip on the meaning of the auxiliary parameters, we will first take a second look at the way the preferences of the respondents are modelled. Basically the model assumes that respondents, when confronted with a stack of profiles, seek for the most preferred profile first. Subsequently they are assumed to search the remaining profiles for a second most preferred profile. They repeat this process until just one profile is left, which is least preferred. Starting with a stack of 18 profiles, respondents thus have to make seventeen choices. In section 4.3 we assumed that respondents would use the same selection criteria in each subsequent choice. This assumption enables us to model the choice process by means of a rank ordered logit model. However, two systematic errors turn up in the profile rankings, for which we have to adjust the model.

A.1 Heteroscedasticity

The ranking of a profile is explained in part by explanatory variables (profile and respondent characteristics) and in part by an error term. The error term however increases as respondents rank lesser preferred alternatives. So, if we estimate a model treating all choices equally, the error term may partly overshadow the real effects. Analogous to Hausman and Ruud (1987) we can correct the overestimation of the error term by introducing heteroscedasticity parameters σ_i which account for the (lack of) accuracy of each choice i. As respondents make seventeen choices when ordering a set of eighteen profiles, there are seventeen coefficients σ_i. The first one is set to one, while σ_{16} and σ_{17} are set to zero, as these became negative in our non-constrained estimation procedure (see also A.3).

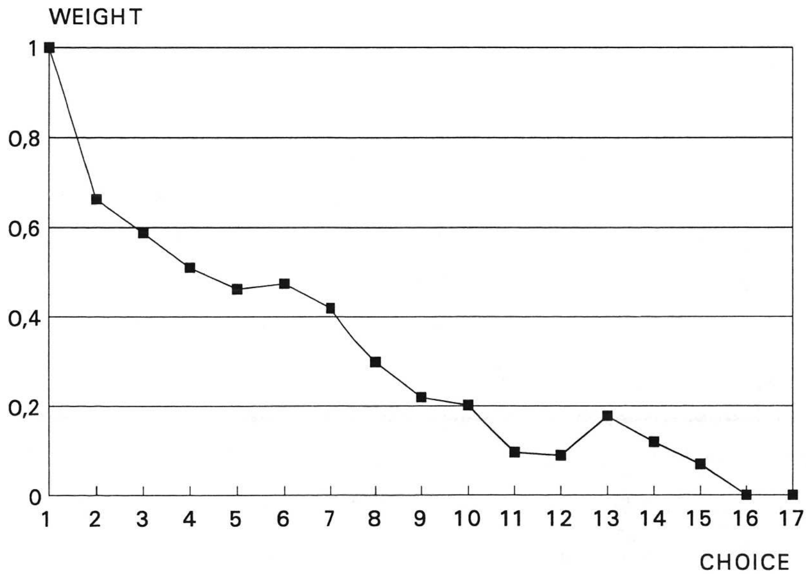
Table A.1 Heteroscedasticity weights for 'real' coefficients

σ_1	1	σ_{10}	.20 (.05)*
σ_2	.66 (.07)*	σ_{11}	.10 (.05)*
σ_3	.59 (.06)*	σ_{12}	.09 (.05)
σ_4	.51 (.06)*	σ_{13}	.18 (.05)*
σ_5	.46 (.06)*	σ_{14}	.12 (.05)*
σ_6	.47 (.06)*	σ_{15}	.07 (.05)
σ_7	.42 (.06)*	σ_{16}	0
σ_8	.30 (.05)*	σ_{17}	0
σ_9	.22 (.05)*		

a Standard errors between brackets
* Significant at 5%-level

Table A.1 presents the estimation results for the accuracy parameters σ_i . Nearly all σ-parameters are strongly significant. Figure A.1 gives a graphic impression of the σ-parameters. It shows that the parameters σ_i perform in a similar manner as in Hausman and Ruud (1987). Except for the first choice, they decrease almost monotonically. The figure shows strongly that the latter seven choices are made much more loosely than the first ten. The first choice takes a slightly different position. Apparently respondents choose

Figure A.1 Heteroscedasticity parameters for the explanatory variables in each subsequent choice



a most preferred profile much more accurately than the choices thereafter. This choice behavior may be related to the fact that in reality the choice of the most preferred applicant has more significance than the ranking of subsequent candidates; unlike the latter, the former will usually be hired.

A.2 Order of supply

The second systematic error we want to correct for, results from the order of supply of the profiles. The poll-takers handed over a complete stack of eighteen profiles to each respondent. If respondents find it hard to choose between profiles, they may be tempted to leave profiles in the original order of supply. The order of supply thus may influence the preference ranking of the respondents.

Table A.2 Order of supply-effect

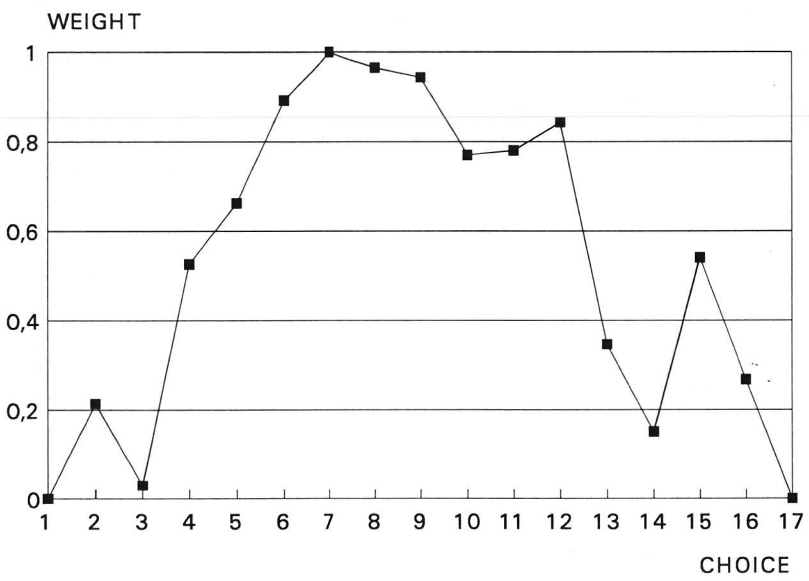
γ	- .07 (.01)*		
τ_1	0	τ_{10}	.77 (.23)*
τ_2	.21 (.17)	τ_{11}	.78 (.24)*
τ_3	.03 (.16)	τ_{12}	.84 (.25)*
τ_4	.53 (.19)*	τ_{13}	.35 (.22)
τ_5	.66 (.21)*	τ_{14}	.15 (.22)
τ_6	.89 (.24)*	τ_{15}	.54 (.25)*
τ_7	1	τ_{16}	.27 (.25)
τ_8	.97 (.25)*	τ_{17}	0
τ_9	.94 (.25)*		

a Standard errors between brackets
* Significant at 5%-level

We can correct for this effect by incorporating a variable γ which represents the effect of the initial ranking of each profile. Parallel to the explanatory variables, this correction term does not play an equally important role for each subsequent choice. However, the similarity is limited, since it seems unlikely that the supply-order will be most important for the first choice and decreasingly important for the following choices. Therefore γ is accompanied by its own set of heteroscedasticity parameters τ_i.

Table A.2 presents the estimation results for γ and τ. The table shows that the initial order does play a significant role in the observed rankings. However, figure A.2 shows that the order of supply is rather immaterial for the first choices. High ranking alternatives win their high preferences independent of their order of appearance. The same applies for the worst alternatives. For the middle region the supply-order does have some relevance. Thus, the order of supply does play a significant role in the observed rankings, but this role is limited to the middle region of the ranked profiles.

Figure A.2 Heteroscedasticity parameters for the order of supply-effect



These results shed some light on the way respondents rank profiles. A possible explanation is that they first search the stack of profiles for good ones and bad ones. The good ones are put on top, the bad ones at the bottom. The intermediate profiles are left more or less in the original ordering. Secondly respondents review the ranking of the most preferred profiles. This can be derived from the high accuracy of the first choices. The accuracy-parameters also indicate that respondents do not review the ranking of the least preferred profiles.

A.3 Tests of significance

In order to see whether the model complications σ and τ give sensible improvements four hypotheses were tested: $[\sigma_i = 0, i = 1,..,17]$, $[\sigma_i = 1, i = 1,..,17]$, $[\tau_i = 0, i = 1,..,17]$ and $[\tau_i = 1, i = 1,..,17]$. Table A.3 presents the results for these tests. The first line in the table gives the log-likelihood when both σ_i and τ_i are unrestricted. The second line refers to the model described in this section, which is a slightly restricted version of the general model (σ_{16}, σ_{17}, τ_1 and τ_{17} are set to zero). We can see from the difference in the log-likelihoods that this restriction is accepted. All other restrictions are rejected, including the random model $\sigma_i = 0$, $\tau_i = 0$, $i = 1,..,17$.

Table A.3 Log-likelihoods for several specifications of the model

σ	τ	**log-likelihood likelihood**	**likelihood-ratio-statistic (df)***
estimated	estimated	-10601.4	-
estimated, σ_{16}, $\sigma_{17} = 0$	estimated, τ_1, $\tau_{17} = 0$	-10605.4	8.0 (4)
estimated	1	-10632.4	62.0 (17)
estimated	0	-10700.4	198.0 (17)
1	estimated	-10824.3	445.8 (17)
0	estimated	-11248.7	1294.6 (17)
0	0	-11355.4	1508.0 (34)

* chi-square values (95%): 9.5 (df = 4), 27.6 (df = 17), 48.6 (df = 34)