

Online Appendix

The application of factorial surveys to study recruiters' hiring intentions: Comparing designs based on hypothetical and real vacancies

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1. Introduction

This online Appendix provides additional information on our sampling process. We also provide additional robustness checks regarding our experimental design.

2. Selection of occupations

Table A1 shows an overview of all occupations targeted in the present study and the respective ISCO-08 codes.¹ As mentioned, we were only able to consider the data from catering and information technology (IT) in our analyses. The ISCO categories were used as a reference point during the sampling process for the selection of real vacancies as well as for the filtering of respondents in the hypothetical vacancy sample.

Table A1 Overview of ISCO categories

Occupation	ISCO-08 code
<i>Manufacturing</i>	
Industrial mechanics	7233
<i>Finance</i>	
Securities and financial brokers	3311
Insurance representatives	3321
<i>Nursing</i>	
Professional nurse	3221
Health care assistants	5321
Home-based personal care workers	5322
Child care workers	5311
<i>Information technology</i>	
System analysts	2511
System developers	2512
Web and multimedia developers	2513
Applications programmers	2514
Database designers and administrators	2521
System administrators	2522
Computer network professionals	2523
<i>Catering</i>	
Waiter/Waitress	5131

3. Sampling of real vacancies

Table A2 provides the list of online job portals and company websites used to collect job advertisements. Within each occupational category, we considered only entry-level jobs located in Luxembourg, excluding vacancies that referred to senior positions, required higher-level educational degrees (Master degree or higher), required more than five years of work experience, or were located in another country. Besides generic job portals, we also searched on occupation-

¹ We focused on similar occupations as NEGOTIATE (2020).

specific job portals in some occupations, if available. We selected job portals and websites that provided the most job advertisements matching our criteria during our pilot study to make the collection of vacancies as efficient as possible.

Table A2 Overview of job portals and company websites

Name of job portals	Link to job portals
Generic job portals	
Monster	http://www.monster.lu
Jobs	http://www.jobs.lu
Jobfinder	http://www.jobfinder.lu
Moovijob	http://www.moovijob.com
EURES	https://ec.europa.eu/eures/public/en/homepage
Indeed	http://www.indeed.lu
JobStreet	https://www.jobstreet.lu/en-GB
Nursing	
	https://www.randstad.lu/emplois/
	https://www.chl.lu/fr/job/professions-soignantes
	https://jobs.servior.lu/de
	http://www.shd.lu/ge/Jobs/Job-Portal
	https://www.elisabeth.lu/offres-emploi/
	http://www.fgfc.lu/online/www/nav-content/FRE/index.html
	http://recrutement.croix-rouge.lu/
	http://www.fal.lu/stiftung/jobs/
	http://www.cjf.lu/emploi.html
	https://www.apemh.lu/
	http://youthhostels.lu/de
Information technology	
ICT jobs	https://www.ictjob.lu/
Finance	
Efinancialcareers	https://www.efinancialcareers.lu/
Catering	
Horeca	https://www.horesca.lu/fr/jobs-list
Hotellerie-Restauration	https://www.lhotellerie-restauration.fr/emploi/
Menu Lux	http://menu.lu/fr/offres-d-emploi
Lux Bazar	http://www.luxbazar.lu/Emploi.htm

To facilitate the search for vacancies that would match our pre-defined criteria, we used a set of keywords on each website. The keywords corresponded to generic job titles that are most common in Luxembourg regarding the type of jobs of interest. Since Luxembourg is a multilingual country, the keywords were used in both German and French and, in some cases, in English (e.g., regarding

jobs in information technology and finance). Most of the job portals offer pre-defined search categories that matched our occupations of interest, which were also used to make the collection of vacancies more efficient.

For the collection of vacancies in IT, a computer program was used to sample job advertisements from the website “indeed.lu”, one of the largest online job portals. The tool collected information on job title, company name, location of the job, and the direct link to the job advertisement and saved it in a data set.² The recruiter details (such as email addresses and names) were still added manually and by calling the companies and asking for the respective information. Standardized scripts were used for the phone calls.

4. Sampling strategy: hypothetical vacancies

As stated in our manuscript, we sampled additional respondents from publicly available lists of companies within each occupation. We used different sources (e.g., yellow pages) and strategies in each occupation. Since we focus on jobs in catering and IT in our analyses, we restrict the following description to these two occupations.

To find companies and recruiters in the field of catering and IT, we mostly used the website *kompas.com*, which offers a registry of different firms in different countries including Luxembourg. Regarding catering, we collected companies within the category “Restaurants and Bars”. Regarding IT companies, we searched within the category “Information technology (IT) and Internet”. We used a web-scraping tool to collect information on company names, telephone numbers, and, if available, email addresses of persons most likely involved recruitment (e.g., business owners, managing directors).³ The information was stored in a data set. To collect information on companies in catering, we additionally referred to *editus.lu*, a business directory for Luxembourg (similar to the yellow pages), where we manually collected information on companies. In a second step, we called the respective companies to gather missing information on email addresses and names of persons actively involved in recruitment for the occupations of interest in our study. Again, standardized scripts were used for the phone calls.

² This was done using the free software R. The R script is available on request.

³ Again, this was done using the software R.

5. Robustness checks: experimental design

Table A3 (catering) and A4 (IT) show Pearson's correlation coefficients between our vignette variables (as dummies for each category) and key observed respondent characteristics (as dummies for each category). Table A5 shows the correlation between the error term u_j and the observed control variables obtained from fixed-effects regressions in each occupation. If the randomization of vignettes to respondents was successful, the overall correlation between the observed variables in the model and the error term u_j should be close to zero.

Table A3: Correlations between vignette variables and key observed respondent characteristics (catering)

	Vignette variables									
	1	2	3	4	5	6	7	8	9	10
Respondents										
Female (1/0)	0.000	-0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Luxembourgish citizenship	0.000	-0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Age	0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
Highest educational level										
Compulsory school	0.000	0.000	0.000	0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
Vocational training	0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
University entry qualification	0.000	0.000	0.000	0.000	-0.000	0.000	-0.000	-0.000	-0.000	-0.000
University degree	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Other	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Pairwise correlations between vignette variables (as dummies for each category) and observed respondent characteristics (as dummies for each category).

Pearson's correlation coefficient.

Vignette variables: 1=Female, 2=No unemployment, 3=Unemployed after graduation, 4=Currently unemployed, 5=Luxembourgish native, 6=Portuguese foreigner, 7=Luxembourgish-Portuguese foreigner, 8=French border worker, 9=French foreigner, 10=German border worker.

Table A4: Correlations between vignette variables and key observed respondent characteristics (IT)

	Vignette Variables									
	1	2	3	4	5	6	7	8	9	10
Respondents										
Female (1/0)	0.000	0.000	-0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Luxembourgish citizenship	0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
Age	0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	0.000	-0.000	-0.000
Highest educational level										
Vocational training	0.000	0.000	0.000	0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
University entry qualification	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
University degree	0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	0.000
Other	0.000	0.000	0.000	0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000

Pairwise correlations between vignette variables (as dummies for each category) and observed respondent characteristics (as dummies for each category).

Pearson's correlation coefficient.

Vignette variables: 1=Female, 2=No unemployment, 3=Unemployed after graduation, 4=Currently unemployed, 5=Luxembourgish native, 6=Portuguese foreigner, 7=Luxembourgish-Portuguese foreigner, 8=French border worker, 9=French foreigner, 10=German border worker.

Table A5: Correlation between the error term u_j and control variables in fixed effects models

	Correlation (u_j, X)
Catering	-0.000
Information technology	0.000

Note: A fixed-effects model was estimated in each occupation only including the vignette variables as predictors to test for the influence of unobserved respondent characteristics

References

NEGOTIATE (2020). *NEGOTIATE Employer Survey. Scientific Use File. Data Documentation.*
Oslo: OsloMet.