Focused information on skills demand using internet job search data (with results for Slovak university graduates)[1]

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Abstract

Presented paper explores the possibilities of internet job search data as a source of information on skills demand. It introduces two methods of exploiting such data. Classical method is based on a content analysis of vacancies advertisement. The CV method employs information on individuals stated in their CVs. The analysis is focused on university graduates looking for a job in three occupational groups: programmers, sales manager and accountant. Some conclusions on skills demand in these three groups are drawn. The results produced by both methods are confronted and their character is discussed.

Keywords: skills demand, web data analysis, tertiary education graduates, recruitment

The Internet is penetrating most of the areas of our everyday lives. With this growing penetration, Internet becomes an even more interesting information source. New and cheaper hardware, as well as software technologies, have enabled storage of vast data, which are mostly gathered for administration purposes. Such data can also become a useful, inexpensive and available source of information for social scientists in various areas. This paper describes one possible way how to exploit data gathered to administrate a job search web page. The following section will briefly describe the data gathering process and the character of acquired data. Afterwards chosen methodology is described. The third section brings results of skills demand in three occupational groups applied on the population of university graduates. The paper concludes with some questions for the discussion in the final section.

1. Description of the data

Web pages designed to intermediate job search process usually perform two procedures. The first one is a traditional collection of job advertisement and its consequent display on the web. This is in principle the same what newspapers are doing for centuries. The second procedure was enabled latter; nearly one decade ago, by the advancement of web technologies. It consists of picking up information about the applicants, using a standardised "CV" form. These CVs are consequently offered to employers looking for an employee. Employers can browse the database with all the

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attributes (skills) stated in the CV for free. If they find an appropriate applicant, they pay for the display of contact details, so they can contact the applicant. Companies running the jobsearch web sides have information on the attributes in the CVs and also on the number of displays of each CV

Let us name the first way of gathering data, the "classical method" and the second way the "CV method". Both patterns of internet mediated jobserach can be found internationally; there are therefore reasons to assume that they could become an international source of information on skills demand.

1.1 Classical method

Data picked via the "Classical method" which were made available for the analysis contain:

- basic information on the job vacancy *(position name -string and categorized, location, type of contract …)*
- requirements on the applicant *(level of required education, years of previous experience, required skills -string and categorized, …)*
- information on the company *(location, number of employees, business area)*

This data will be handled to provide information on skill requirements employers put on employees, when filling up open vacancies. For this sake we basically make two steps. Firstly we select a specific group (in this paper in terms of occupation) for which we would like to identify the skill requirements. Secondly we rank required skills according to how often do they appear in the advertisements.

For the sake of the analysis, all advertisements uploaded during 2009 and 2010 were made available.

1.2 CV method

Data picked up by the CV method, which were made available; contain information published in standardised CVs on:

- **gender**
- **age**
- **achieved education** (university, faculty)
- **experience**
- **skills** (language skills, economic knowledge, office software s., advanced computer skills, …)
- **industry**, where the individual is looking for a job
- **position**, which the individual is addressing
- **region**, in which the individual is willing to enter a job

This information is complemented with the information on how many times were the **contact details of each CV displayed** by the employers during the period of 2009.

Disposable data allow constructing a regression based model, in which the number of displays becomes the dependent variable and the attributes from the CVs are potential independent variables. Thanks to this, we can rank the skills according to the outcome of such approach.

This technique can also be used separately on particular groups. In comparison to a simple ranking based on frequencies of appearance, which was used when processing the classical method data, construction of a regression based model allows us to include some side effects as for example gender of age. To make the results of both methods comparable we will focus purely on skills.

When using the CV method, we operate with CVs, which were uploaded during 2009 and the number of contact details displays counted within the year 2009. The most common length of CV publication is 3 months, but it can be prolonged. The length of the publication does not have any significant effect on the number of contact details displays of a CV.

1.3 Data issues

Employers as well as applicants were selecting from the same lists of positions, areas of economic activity and skills. Thanks to this, information picked via both methods becomes comparable. It also makes things easier for eventual quantitative analysis as these information are coded using the same codes. The data were gathered for a different purpose than our skills demand analysis; this fact is a source of various limitations. The lists (positions, areas of economic activity, skills) were designed based on existing demand. Despite the fact, that the lists are fairly extensive (over 500 occupations, 57 sectors and 140 skills), they do not cover the whole continuum equally. For example there are more precise positional/occupational categories in the IT sector than for the health sector, because there is a higher demand from employers and applicants looking for labour/job in the IT sector. Used lists also are not linked to official statistical classifications. For the purpose of this analysis links between used lists and ISCO-International Standard Classification of Occupations[3] and NACE-The Statistical Classification of Economic Activities in The European Community[4] were approximated.

This brings us to the question of representativeness of such data. Thanks to the constructed link between used lists and existing classifications, we can compare representation of occupational and economic sector groups. The data allow us to complement this with the information on age, gender and level of education. Our analysis is based on filtering one particular occupational group; therefore we do not need the whole dataset to be representative for the whole working population. On the other hand, we need to understanding existing biases of representativeness to know the limits of the data. A more detailed representativeness analysis focusing on age, gender, region and education was done in (Štefánik, 2010a). The main findings were that women are slightly underrepresented in the sample as well as age and educational level playing crucial roles in creating bias when comparing to the whole population. The population of users of the web page seems to be strongly biased towards age groups between 20 and 35 years with tertiary education. For this reason we have decided to limit our analysis on university graduates. There are also some biases observable when looking at the field of acquired education. Graduate from economic and technical study programmes are overrepresented in the sample. On the other hand, graduates from arts and medicine are underrepresented. There are also significant biases within each of these fields, for example graduates from medical study programmes such as pharmaceutics are overrepresented, while medical doctors are underrepresented. All these biases stem from differences in users of the web page.

Looking at economic sector, we found out that private services are strongly overrepresented and public services strongly underrepresented in the figures of published advertisements and CVs. (Štefánik, 2012). Occupational structure is covered adequately when looking at ISCO 1-digit level and comparing to working population with tertiary education. Clerks and service workers were slightly overrepresented, but this is a result of the option to select more than one educational level when

[3] http://www.ilo.org/public/english/bureau/stat/isco/index.htm
[4] http://ec.europa.eu/competition/mergers/cases/index/nace_all.html

publishing an advertisement. Regional bias is surprisingly not a problem, despite the clustering effect of the capital-Bratislava on the rest of Slovakia.(Štefánik, 2010b).

2. Selected methods

If we would be looking for the information on overall skill demand in the country, the abovementioned biases would limit our findings very dramatically. But the real strength of the data we have available here is not to draw conclusions representative for the whole working population in Slovakia, but to produce focused information on skills demand in one segment of the labour market, in case of this paper in one occupational group. Based on our findings on strong age and educational-based biases, we will limit our analysis to university graduates in Slovakia graduating after 2004. University graduates present a group, which is facing bigger problems when looking for a job in comparison to the overall population. This is because of their lack of working experience, higher unemployment of graduates, which is a result of overlapping supply in this segment of the market. Consequently the employers can be pickier when hiring a graduate, their skills demand can be therefore formulated more precisely when focusing on graduates.

2.1 Classical method

We have selected those advertisements which stated that the offered job is suitable for a graduate and were looking for a person with tertiary education in the period between January 2009 and December 2010. Out from these advertisements we have selected those which were addressing three selected occupational groups:

Programmer
Sales manager
Accountant

These three groups were selected because they were sufficiently numerous and were the least concerned with abovementioned biases in representativeness. In dealing with the data gathered via the classical method, we simply rank the skills according to how often they were mentioned in the advertisements.

2.2 CV method

The data gathered via CV method enable to link the attributes of individuals stated in the CV with the number of displays of each CV. The basic idea is to build a regression based model where the number of displays would be the dependent variable and the characteristics stated in the CV could become independent- explanatory variables. As the number of displays has the shape of a Poisson distribution we cannot use a classical linear regression nor a binary based logistic regression.

Table 1: Dscriptive statistics- dependent variable- number of displays

Displays		
N		25634
Mean		12,68312
Median		3
Mode		0
Std. Deviation		24,49471
Minimum		0
Maximum		311
Percentiles	10	0
	20	1
	30	1
	40	2
	50	3
	60	5
	70	8
	80	16
	90	39

Source: Authors' own calculations

Skills are measured as a skill level using 3 level scales in case of software and other skills and 5 level scales for language skills. The picked information has therefore a character of an ordinary variable, with possibility to include it as categorical but also as continuous quantitative variable, but with no hope for normal distribution. For these reasons we have picked generalized linear models to employ the data in a regression based model. We expect a Poisson distribution for the dependent variable and use a log link function for the other variables in the model.

Our analysis is focused on skills required on the three selected occupational groups. We have grouped the skills into seven summary indexes of:

- language skills
- administrative and professional skills
- office software skills
- graphical software skills
- programming language skills
- database skills
- IT systems administration skills

The basic model includes all these skill indexes together with control variables:

- Gender
- Finished university
- Region
- Age
- declared level of Slovak (the fact whether an applicant mentioned his level of Slovak in the CV showed to be very significant)

A variable referring to the number of days the CV was published was included as an offset variable.

The basic model gives us rough information on skills preferences in terms of summed skill indexes. Afterwards we will run 7 models with disaggregating each one of the skill indexes and controlling for the effect of other skills including other 7 summed skill indexes. The other control variables remain

the same as in basic model. This allows us to include each skill particularly, without including too many variables, or excluding areas of skills.

3. Results

Findings from the classical method data can be found in the following table. The table lists the skills most frequently mentioned in the advertisements looking for one of the 3 occupational groups. Employers were able to choose more than one skill and more than one occupational group for each advertisement. The table therefore reports the percentage of all skill choices and of all advertisements.

Table 2: Skills mentioned in advertisements looking for programmers, sales managers and accountants

Programmer				**Sales manager**				**Accountant**			
	Responses	**% of choices**	**% of adds**		**Responses**	**% of choices**	**% of adds**		**Responses**	**% of choices**	**% of adds**
English	6783	29,7	91,6	English	6451	18,2	67,3	English	6356	22,4	79,1
German	1319	5,8	17,8	Microsoft Excel	5895	16,7	61,5	Microsoft Excel	3518	12,4	43,8
Java	1275	5,6	17,2	Microsoft Word	5708	16,1	59,6	Double-entry bookkeeping	3191	11,2	39,7
SQL	1133	5,0	15,3	Microsoft Outlook	3832	10,8	40,0	Microsoft Word	2991	10,5	37,2
C/C++	887	3,9	12,0	Internet (e-mail, www)	3617	10,2	37,8	German	1626	5,7	20,2
Java EE	759	3,3	10,2	Microsoft Powerpoint	2493	7,0	26,0	Microsoft Outlook	1528	5,4	19,0
C#	686	3,0	9,3	German	1803	5,1	18,8	Internet (e-mail, www)	1461	5,1	18,2
HTML	658	2,9	8,9	Microsoft Windows	1006	2,8	10,5	Invoicing	1408	5,0	17,5
Microsoft Excel	612	2,7	8,3	Slovak	808	2,3	8,4	Payroll accounting	692	2,4	8,6
JavaScript	574	2,5	7,7	Business correspondence	510	1,4	5,3	Cash register	678	2,4	8,4
XML	535	2,3	7,2	Invoicing	490	1,4	5,1	Business correspondence	460	1,6	5,7
.NET	518	2,3	7,0	Hungarian	429	1,2	4,5	Single-entry bookkeeping	453	1,6	5,6
PHP	506	2,2	6,8	Warehouse management	250	0,7	2,6	Microsoft Powerpoint	421	1,5	5,2
Microsoft Windows	429	1,9	5,8	OpenOffice	210	0,6	2,2	Warehouse management	413	1,5	5,1
Microsoft Word	413	1,8	5,6	Russian	161	0,5	1,7	French	388	1,4	4,8
Oracle Database	385	1,7	5,2	Cash register	145	0,4	1,5	Microsoft Windows	361	1,3	4,5
ASP.NET	362	1,6	4,9	AutoCAD	141	0,4	1,5	Italian	350	1,2	4,4
Microsoft SQL Server	356	1,6	4,8	Human Resources	128	0,4	1,3	SAP	313	1,1	3,9
UNIX/Linux	339	1,5	4,6	French	127	0,4	1,3	Human Resources	283	1,0	3,5
MySQL	334	1,5	4,5	Czech	127	0,4	1,3	Hungarian	258	0,9	3,2

Internet (e-mail, www)	313	1,4	4,2	Typing	122	0,3	1,3	Slovak	241	0,8	3,0
UNIX/Linux administration	307	1,3	4,1	Microsoft Access	117	0,3	1,2	Spanish	231	0,8	2,9
Microsoft Outlook	292	1,3	3,9	Polish	108	0,3	1,1	Typing	119	0,4	1,5
PL/SQL	280	1,2	3,8	SAP	94	0,3	1,0	Polish	108	0,4	1,3
Microsoft Powerpoint	209	0,9	2,8	Lotus Notes	85	0,2	0,9	POHODA	75	0,3	0,9
Slovak	197	0,9	2,7	Italian	46	0,1	0,5	Dutch	68	0,2	0,8

Source: Authors' own calculations

According to the frequency of mentioning in the advertisements, English is the most demanded skill of programmers, sales managers as well as accountants. In case of programmers, English is followed by German and focused programming skills related to programming languages, such as Java, C++ or SQL. In case of sales managers, the skills demand is oriented more towards office software of wide usage, such as Microsoft Office software, this is combined with professional skills such as invoicing or human resources, together with other language such as German, French or Russian. Accountants should be able to work in Microsoft Office and possess skills related to bookkeeping and other specific accounting skills such as payroll accounting; other languages and office software are mentioned quite often as well.

At the first glance, the results of such analysis bring quite trivial results. Nevertheless they present a first overview on skills demand in these three occupational groups. They also bring a quantification and confirmation of a common knowledge on skills demand. This is because they are based on publicly declared and commonly known preferences of employers. In comparison data picked via the CV method are based on information on employers' behaviour, which may not be formulated and commonly known. The CV method data should bring information on which skills actually make the difference when deciding to fill a vacancy. But this assumption is related with various complications, which will be addressed in more detail in the discussion.

The following table brings results of the basic model applied on programmers. It reports the values of the regression coefficients (B), the Wald Chi-square statistics and the level of significance related to the regression coefficients. The coefficients (B) bring information on the direction and the strength of the measured relation between skills and the number of displays. Their values should be interpreted with caution also because of the log link function between all entered variables. We will therefore focus only on the direction of the relation. Only those values measured at the significance level below 0,05 will be interpreted. The contribution of each skill to the number of displays can be measured by the Wald Chi-Square statistics. We can rank the skills based on their contribution to the number of displays using values of this statistics.

Table 3: Results of the basic equation

	Programmer			Sales manager			Accountant		
	B	Wald Chi-Square	Sig.	B	Wald Chi-Square	Sig.	B	Wald Chi-Square	Sig.
language skills	0,032	14,434	0,000	0,004	0,592	0,442	0,033	28,757	0,000
administrative and professional skills	-0,009	0,255	0,613	0,033	18,068	0,000	0,011	2,119	0,146
office software skills	0,003	0,422	0,516	0,018	15,200	0,000	0,026	17,551	0,000
graphical software skills	0,001	0,044	0,835	0,004	0,614	0,433	0,000	0,000	0,988
programming language skills	-0,005	0,979	0,323	0,016	1,285	0,257	-0,028	1,303	0,254
database skills	0,031	21,436	0,000	0,014	0,384	0,536	-0,021	0,481	0,488
IT systems administration skills	0,007	0,816	0,366	0,032	5,547	0,019	0,024	0,998	0,318
Log Likelihood	-21277,6			-27462			-20008,2		
N	1034			1464			1288		

Source: Authors' own calculations

Looking at summed indexes has confirmed the common knowledge assumptions in case of accountants. Language and office software skills proved to be those positively influencing the number of displays of CV looking for an accountant job. The importance of language skills jumped up as there are big international companies locating their accounting centres in Slovakia. This has brought many accounting jobs with specific language skill needs, when focusing on accounting in one foreign country. According to expectations administrative and office software skills are those which play the role in case of sales managers. More surprising is a rather small but significant contribution of IT systems administration skills to number of displays of CV looking for a job as a sales manager. Most surprising are the results of the basic model in case of programmers, as language skills and database skills showed to be those contributing to number of displays, and programming skills remaining insignificant. More detailed information on skills important for programmers can be found in the table below.

Table 4: Particular skills related to number of displays of CVs looking for a job as programmers

		Programmer		
		B	Wald Chi-Square	Sig.
language skills	**English**	0,141	6,183	0,013
language skills	**German**	0,033	6,726	0,010
language skills	**French**	0,073	8,012	0,005
language skills	**Serbian**	0,290	17,045	0,000
administrative and professional skills	**Human Resources**	0,361	4,331	0,037
office software skills	**Microsoft Powerpoint**	-0,049	4,112	0,043
office software skills	**Microsoft Dynamics NAV**	-0,212	5,705	0,017
graphical software skills	**Autodesk 3ds Max**	-0,110	5,702	0,017
programming language skills	**4GL**	0,168	4,320	0,038
programming language skills	**Python**	0,085	4,889	0,027
database skills	**SQL**	0,057	7,799	0,005

Source: Authors' own calculations

The table lists skills which proved to be contributing to the number of displays significantly at the 0,05 significance level in one of the 8 extended models. The first extended model putting to equation all language skills together with the remaining 7 summed skill indexes and other control variables. English, German, French and surprisingly Serbian showed to be increasing the number of displays. Serbian showed to be the skill with the strongest contribution to number of displays. This could be caused by various reasons, one of which could be that there is indeed a need for programmers speaking Serbian. Such assumption would nevertheless need to be confirmed by some further analysis or an expert judgement.

The skills listed in the table do not present the most demanded skills, but those which actually make the difference and attract the attention of employers searching the database. In case of programming skills 4GL and Python showed to be those programming languages which actually make the difference. This pays also for SQL, MS Powerpoint, MS Dynamics NAV or declared skills and knowledge in dealing with human resources.

The following table lists the skills related to sales managers.

Table 5: Particular skills related to number of displays of CVs looking for a job as sales managers

		Sales manager		
		B	Wald Chi-Square	Sig.
administrative and professional skills	**Double-entry bookkeeping**	0,152	7,762	0,005
administrative and professional skills	**Human Resources**	0,147	8,084	0,004
office software skills	**Microsoft Powerpoint**	0,047	6,340	0,012
office software skills	**Internet (e-mail, www)**	0,061	12,926	0,000
office software skills	**Lotus Notes**	0,039	4,031	0,045
graphical software skills	**Pro/ENGINEER**	0,171	8,814	0,003
programming language skills	**Java**	0,177	6,058	0,014
programming language skills	**Fortran**	0,472	24,795	0,000
programming language skills	**DirectX**	0,436	9,884	0,002
programming language skills	**SIMATIC STEP 7**	0,168	4,425	0,035
database skills	**Microsoft Visual FoxPro**	0,282	10,139	0,001
database skills	**LotusScript**	0,397	9,763	0,002
IT systems administration skills	**Client/server administration**	0,096	4,474	0,034
IT systems administration skills	**Windows server administration**	0,090	5,191	0,023
IT systems administration skills	**LAN/WAN administration**	-0,080	4,854	0,028

Source: Authors' own calculations

No language skills seem to make the difference in case of sales managers, but this does not mean that they are not expected; especially English as was confirmed by the analysis of the classical method data. The most contributing skills are programming language Fortran; common office software skills needed to work with the Internet; and skills related to MS Visual ForPro database software.

The following table shows those skills, which make the difference in case of CVs of accountants.

Table 6: Particular skills related to number of displays of CVs looking for a job as accountants

		Accountant		
		B	Wald Chi-Square	Sig.
language skills	**English**	0,130	18,217	0,000
language skills	**German**	0,036	9,652	0,002
language skills	**French**	0,062	13,824	0,000
language skills	**Hungarian**	0,030	4,130	0,042
language skills	**Croatian**	0,128	5,624	0,018
language skills	**Portuguese**	0,254	5,205	0,023
administrative and professional skills	**Typing**	0,089	5,453	0,020
administrative and professional skills	**Invoicing**	0,125	7,690	0,006
administrative and professional skills	**Business correspondence**	-0,127	9,226	0,002
administrative and professional skills	**Single-entry bookkeeping**	-0,340	6,338	0,012
office software skills	**Microsoft Powerpoint**	-0,082	15,348	0,000
office software skills	**SAP**	0,066	6,623	0,010
office software skills	**Internet (e-mail, www)**	0,064	9,565	0,002
office software skills	**Lotus Notes**	0,106	18,103	0,000
office software skills	**Microsoft Outlook**	0,040	4,689	0,030
office software skills	**Microsoft Project**	0,110	4,629	0,031
office software skills	**POHODA**	-0,200	18,474	0,000
graphical software skills	**Adobe PageMaker**	0,345	7,589	0,006
programming language skills	**Microsoft Visual Basic**	-0,245	4,272	0,039
database skills	**Microsoft Visual FoxPro**	0,282	10,491	0,001
database skills	**SQL**	0,145	8,594	0,003

Source: Authors' own calculations

Among language skills, English, German, French, Hungarian, Croatian and Portuguese showed to play a role. As was mentioned earlier, international companies moved recently some of their accounting centres to Slovakia; this has increased the demand for accountants with specific language skills, such as Croatian of Portuguese. Typing, invoicing and business correspondence skills seem plausible in the list of skills expected from accountants. The skills with the strongest contribution to the number of displays are related to the usage of Lotus Notes and local economic software named "Pohoda". Skills in MS Visual FoxPro proved to make the difference in numbers of displays also in case of accountants.

4. Conclusions and discussion

This paper brought information on skills demand mined from data gathered to administrate a job search web page in Slovakia. This data is relatively accessible and inexpensive in comparison with, for example skills survey data. We brought results based on data picked via two different methods. The first one, called the classical method is based on content analysis of advertisements. It brings the information on what skills are mentioned in the advertisements and how often. The second method is based on data gathered in CVs of persons looking for a job. The information on individual characteristics stated in the CVs is linked with the information on how many times each CV was displayed. This information can be employed in a regression based model to look for relations

between individual characteristics and the number of displays. While the first method brings information on declared skill demand, the second speaks about undeclared demand, which is observed in the behaviour of employers searching the database.

Due to representativeness problems, the analysis was restricted to university graduates graduating after 2004. There are reasons to assume that employers hiring a graduate would be even pickier and formulate their skills demand more rigorously. We have selected three occupational groups: programmers, sales managers and accountants, to produce more focused information.

In general, we can conclude that the classical method produced information, which mainly has confirmed common knowledge assumptions on skill requirements in the selected occupational groups. On the other hand it has provided a reliable quantification of existing skills demand.

CV method data brings information on which skills actually make the difference in the attractiveness of a CV. Therefore there are some skills arising, which can be considered as surprising in relation to the chosen occupation. Such conclusions should be drawn with caution, as various circumstances may bias the estimation of the coefficients.

In combination both methods can bring fairly reliable results, which may not be trivial. The importance of language skills required of programmers can be put as an example here. In case of programmers, language skills showed to be possibly the moment of comparative advantage among applicants for job as a programmer. English, German and French were surprisingly complemented by Serbian in the results of the CV data method. If we have looked only on classical method data, only the importance of English would jump out. In reality, also in Slovakia “second languages” such as German and French can make the difference in the attractiveness of a CV. Future programmes should also have some skills in working with databases, namely SQL, what was confirmed by both kinds of employed data. Despite the fact that in advertisements employers declare to be interested mostly in JAVA or C++ skills, Python and 4GL programming languages showed to be those strongly increasing the numbers of displays of the CVs.

In case of sales managers - applicants, language skills (English, German) are declared to be demanded in the advertisements. The CV method did not confirm this declaration. Administrative and professional skills together with office software skills seem to be crucial for this position as they were declared widely in the advertisements and confirmed in the CV analysis. Surprisingly sales managers - applicants possessing some more specialized IT skills, related to programming languages, databases and IT system administration seem to be more attractive for employers searching the CV database. This is despite the fact that such skills demand was not declared in the advertisements.

Accountants in Slovakia should have language skills. English is a must, but also more “exotic” languages such as Croatian or Portuguese can make a difference. Professional skills such as business correspondence or invoicing were confirmed by both kinds of data. Office software skills in general were confirmed by both kinds of data, but the CV method pushed forward skills related to different software; namely Lotus Notes and Pohoda skills showed the strongest contribution to number of displays. Also an applicant for an accounting job gets more attractive if he possesses some more advanced IT skills.

As mentioned before, the fact that the data were picked for a different purpose than skill needs analysis bring some possible complications to our analysis. Most of it stems from the insufficient information on employers searching the CV database. We do not know whether the display was done by the future employer or a personal agency. Some clients of the web side company have paid a permanent access to contact details and some pay for each display, their searching behaviour is probably different. Another weakness of the data is that we do not know whether the display is related to filling in the position stated in the CV. Applicants can state more than one desired position. CVs can be displayed regardless of the declared desired positions. Further information on the displaying employer would significantly improve this kind of analysis.

Presented findings stem only from a "first approach" analysis. Available data offer possibilities for further testing of each of the conclusions. Either that or a support of an expert judgement is needed for further verification.

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