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Evidence of Ethnic Discrimination in the Swedish labor Market Using Experimental Data*

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Abstract: We present experimental evidence, using the correspondence testing method, for discrimination in hiring against men with an Arabic sounding name (in Sweden). The method is designed to find a highest bound of discrimination in the labor market. Hence, we have investigated sectors of the economy where ethnic discrimination is expected to be the worst, but also sectors where immigrants are overrepresented. Also, both skilled and unskilled occupations were used.

The results, using the ILO definition, show that every fourth employer discriminates men with an Arabic sounding name. However, when using this result in simulating how discrimination affects the unemployment rate for the discriminated group, we find that ethnic discrimination only is responsible for less than one third of the native-immigrant unemployment gap.

We extend previous analyses using this method by also interviewing employers after making the choice of who to call for interview. We find that employers that discriminate to a larger extent are public employers, small enterprises and having a Swedish male being responsible for hiring personnel.

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1. Introduction

The unemployment rate is relatively high for many immigrant groups in Sweden when compared to natives, especially for groups that have immigrated to Sweden from countries outside Europe. However, income differences compared to natives is negligible if employed in the same sector. Hence, integration problems faced by immigrants is to a large extent concentrated to the process of hiring. One possible explanation to this finding is ethnic discrimination. Another is unobserved (to the researcher) productive “Swedish-specific” characteristics, such as language skills. The extent of ethnic discrimination is difficult to measure using register data since not all differences in productive characteristics are controlled for. Hence, experimental methods are called for.

Internationally, different forms of field experiments have been used to test for discrimination in hiring (see Rich and Riach, 2002). The method implies that the researcher specifically analyses the hiring process. Correspondence testing implies that the researcher sends two equal applications (equal as regards productivity characteristics) to advertised job openings. The only thing that differs between the two applications is the name of the applicant; one having a Swedish sounding name and the other an Arabic sounding name. These applications are sent to statistically enough job openings and ethnic discrimination is quantified by the difference in the number of call backs for interview between the two ethnic groups (see also below for the ILO definition).

There are reasons to expect that discriminatory behavior exists among Swedish employers. Longitudinal attitude surveys in the general public show evidence of negative attitudes toward immigrants in general (FSI, 2001, 2004) and surveys among potentially discriminated groups also point in this direction (Lange, 2001). Also, most quantitative studies of the phenomenon, using the “residual approach”, i.e. differences that remain after controlling for as much as possible in a native-immigrant employment/wage regression is interpreted as discrimination, find that ethnic discrimination exists (Vilhelmsson, 2002 and le Grand and Szulkin, 2000). Rooth (2002) studies individuals who have been adopted from different parts of the world, and conclude that a background indicating a “non-Swedish” look is associated with greater unemployment risks. Holm (2001) reports results from discrimination

experiments suggesting that Non-Swedes were less likely to be chosen as partners in coalition formation games. However, there exists contradictory evidence. Åslund and Rooth (2005) using a natural experiment do not find any evidence that the unexpected events of 9-11 had a more detrimental impact on the labor market opportunities of immigrant groups that were exposed to increasingly negative attitudes.

Our field experimental data using the correspondence testing method were collected during the period May 2005 to February 2006 sending applications to job openings in thirteen different occupations in the Stockholm and Gothenburg labor market areas. In total we sent over three thousand applications to 1,614 job openings. In 527 cases at least one of the two applicants were invited for an interview. It is then found that twenty-nine percent of all employers discriminated the man with the Arabic sounding name (using the ILO definition). We also extended previous analyses by making interviews (sending an e-mail questionnaire or over telephone) with responding employers, i.e. those that responded by inviting at least one for an interview, asking questions and on the size of the firm, the sex and ethnic belonging of the person responsible for hiring personnel etc.. Finally, we simulated what the unemployment rate of natives would be given the call back rate of the Arabic minority. We find that discrimination only is responsible for one third of the native-immigrant unemployment gap.

The rest of the paper is outlined as follows. Section 2 presents the methodology used. Section 3 gives some facts about immigration to Sweden and previous studies of discrimination using the ILO methodology. Section 4 presents the data from the experiment used in the empirical analysis of section 5. Section 6 discusses implications from economic theory by simulating the effect of observed discrimination on the native-immigrant unemployment gap. Section 7 concludes.

2. Correspondence testing – the method described

Situation testing usually includes correspondence testing as a first step followed by audit testing. This study is a correspondence test using written applications, neglecting the second (audit) step. The correspondence test is performed by letting two fictitious equally productive individuals belonging to different ethnic groups

apply to the same job either by telephone or by a written application. The response from the employer is observed to measure potential discriminatory behavior. The response can either be: both invited for interview, one individual invited or neither invited. If both individuals are invited they are treated equally. If neither is invited it can be tempting to view it as equal treatment as well. But in fact we don't know if the employer has even examined the applications before taking any decision. For example, we don't know if the applications were delivered to the employer. The standard approach in this situation is to delete the observations where neither was invited. In the case of one individual invited discriminatory behavior is potentially observed. But it is important to notice that the two individuals can be treated unequal not necessarily because of discrimination. It can also be due random factors (see Bovenkerk et al., 1995). For example if the employer felt tired or accidentally dropped one of the applications we may observe non systematic unequal treatment. Hence, we must correct for such random factors when constructing the measurement of discrimination. By assuming that unfavourable random treatment are equally frequent for the majority and minority group the correct measure of discrimination is obtained as the net discrimination, where the cases of random unequal treatment are cancelled out. Thus the measure of discrimination in a correspondence test is calculated by first taking the difference between the number of observations of unequal treatment towards the minority and the number of observations of unequal treatment towards the majority. Second, the difference is divided by the number of usable tests, that is, the number of cases where at least one individual is invited.

The second step in the situation test is the audit test where real persons are actually sent to interview. Assuming that the invitations for interviews are generated from a preceding correspondence test different methodology can be used to decide which individuals to send. Basically, what have to be decided upon is whether to send only the pairs of individuals where both are invited or if all invitations should be carried out. Both approaches have been used in different studies.⁴ If only pairs of individuals are sent for interview the measure of discrimination is calculated in the same fashion as before. A cumulative

⁴ ILO and USA's motsvarighet

measurement of discrimination can be obtained by summing the discrimination at the different steps.

2.1 Limitations

The method has some general limitations (see Allosino et al., 2004). First of all, it can not be argued that the collected vacancies are representative for the labor market as whole. For practical reasons, only some of the channels used by applicants in the labor market can be utilized by the researcher to find vacancies. Further, the tests are only performed during a short time period. In addition, typically only one minority group and one gender are examined. Hence, it is not possible to generalize the results or compare with other studies. Bovenkerk (1992) makes clear that the situation test can only be used to measure if discrimination exists or not and maybe if it is high or low. But since each study are controlling for variables with specific values (time, location, minority group etc.) it is not possible to compare the results in-between.

3. Immigrants in Sweden and previous research

Sweden has a relatively large immigrant population in comparison with other Western countries. In 2002, foreign-born individuals made up 12 percent of the total population of about 9 million. Labor migration in the 1950s and 1960s is the main source of a Finnish minority including almost 200,000 people. An increasing influx of refugees and tied movers beginning in the late 1970s has resulted in large minority groups from many geographically distant countries. The Iraqi-born population amounts to more than 60,000; the number of Iranians is more than 50,000.

As in other countries, many immigrant groups in Sweden find it difficult to become integrated in the labor market. In the first six months of 2003, unemployment stood at 3.9 percent among natives according to the labor force surveys; for African (Asian) immigrants this figure was 18.9 (15.7) percent. Previous Swedish research has in general found that discrimination of immigrants in the labor market is an issue of some importance (see e.g. Höglund 1998). Most quantitative studies of the phenomenon use some “residual approach”, i.e. differences that remain after controlling for as much as possible is interpreted as

discrimination (Vilhelmsson 2002, le Grand and Szulkin 2000). Rooth (2002) studies individuals who have been adopted from different parts of the world, and conclude that a background indicating a “non-Swedish” look is associated with greater unemployment risks. Holm (2001) reports results from discrimination experiments suggesting that Non-Swedes were less likely to be chosen as partners in coalition formation games.

3.1 Preference or statistical discrimination

Discrimination in the labor market is defined as when persons who are equally productive and provide labor are treated unequal by receiving different wages or different demand. (see Altonji and Blank, 1999) Discrimination can be divided into taste-based and statistical discrimination.

The beginning of the modern research on economic discrimination started with the publishing of Becker’s theory (1957) which is based on the concept of taste based discrimination. In that model the employer has prejudice against members of the minority group. The employer maximizes utility which depends on production, prices, and wages of the majority and minority group. Due to prejudice the employer has an additional cost of hiring workers from the minority. Given a distribution over the costs for the different firms, only the fraction of firms where the wage plus the extra cost of hiring a member from the minority group is less than the wage of the majority group will hire workers from the minority group. If the wage of the majority group were equal to the wage of the minority group their will be relatively less demand for workers in the minority group. Therefore, the minority group will receive a lower wage.

In a competitive market with zero profits discriminating firms will be driven out market due to higher costs compared with the color blind firms. Hence, discrimination will disappear. Since differences between groups over long periods are still observed, either the differences are not discrimination or there must be friction in the market.

The second type of discrimination where Phelps (1972) and Arrow (1973) have done the pioneering work is statistical discrimination. Economic incentives are the force behind this sort of discrimination. To illustrate the concept, suppose two equal productive individual apply for the same job and one of them are male and one

female. Further, suppose that from historical data it can be seen that females quit with a higher probability before the age of 30. Since a quit will disturb the production of a profit maximizing firm it will hire the male. Thus due to uncertainty about the individuals true productivity the firm uses statistics (accurate or not) to calculate the expected productivity based on the group membership. Individuals belonging to high productive groups gain and individuals belonging to low productive groups suffer.

Even in the absence of labor market discrimination as defined above there may still be discrimination at some place in society affecting labor market conditions for particular groups. Individual's productive characteristics can be affected by pre-labor market discrimination. Current discrimination in the labor market may also affect productivity. If an individual believes that s/he will not be accepted at a particular profession s/he may not invest in human capital.

Traditionally, regression analysis is used to measure discrimination. The main shortcoming with that approach is the problem with unobserved characteristics. Typically, the residual is interpreted as discrimination since it can not be explained by the variables controlled for. But it might be the case that the employer observes productivity characteristics not available to the researcher. Hence, the residual may incorrectly be interpreted as discrimination.

In this study it is not possible to identify the type of discrimination of the employer.

3.2 Previous work using situation/correspondence testing

Since the 90's a number of field experiments with the purpose to survey ethnic discrimination against minority groups have been conducted in Europe. The International Labour Office (ILO) has accomplished tests in five different countries: the Netherlands, Spain, Germany, Belgium and most recently in Italy. At the present time ILO also conducts field experiments in Sweden and in France. The ILO studies often include both a phone call (or a written application) as a first step and an audit test at the interview stage. Apart from the ILO, Esmail and Everington have conducted two tests with written applications in 1993 and 1997 in the UK.

Bovenkerk et al. (1995) apply the ILO method in Netherlands. Discrimination against the two minorities Moroccan and Surinamese male are studied. The

individuals belonging to the minorities are both grown up in the Netherlands. Hence, there should be no uncertainty about their language skills and education. The testers are made identifiable as Moroccans, Surinamese and Dutch through their names.

In the Moroccan study the participants apply by telephone as a first step and on acceptance real persons are sent for interview. Mainly jobs in the service sector and retail trade sector are tested but also occupations such as receptionist, driver, electrician and clerical worker and the vacancies are essentially collected from the newspapers. At the interview offer stage the results contains 112 usable tests and the net discrimination is 50.5 percent (see Table 1). The job offer stage includes only 8 usable tests and the level of net discrimination is 100 percent.

To measure discrimination against Surinamese male Bovenkerk et al. (1995) use written applications. Two equivalent letters are sent to jobs requiring collage education, one for the Surinamese and one for the Dutch. The jobs are selected every week from job vacancies in the newspapers. The categories are financial manager, personnel manager, teacher and laboratory assistant. As a response to the written applications the applicant is either invited for interview or rejected. It is also possible to receive no answer at all. In the case of an invitation for interview the offer is promptly declined. That is, the process is terminated at this point. 299 pairs of letters were sent during the period October 1993 and June 1994. In total 157 cases are usable and the net discrimination against the Surinamese is 28 cases or 17.8 percent.

Bovenkerk et al. (1995) perform some additional experiments in the Netherlands to measure discrimination against Moroccan and Surinamese females and also another experiment with Surinamese males but this time using an audit test. The results from these experiments are included in Table 1.

Another ILO study by Goldberg et al. (1996) investigates discrimination against Turkish workers in Germany. The study actually consists of two parts. In the first part unequal treatment against second generations Turkish workers in the Rhine-Ruhr region are studied by applying to vacancies through telephone. The subjects in the tests are between 20 and 25 years old and the vacancies are collected in the newspapers during the period from November 1993 to January 1994. The jobs

included are semi-skilled in the building trade, light industrial work and in the service sector. The net discrimination measured at the interview stage is 18.9 percent and the number of usable tests is 175.

Table 1 Summary of previous situation tests for ethnic discrimination in Europe

Country/Study	Minority	Usable tests	Net discrimination against minority (%)
<i>Belgium</i>			
Smeeters and Nayer (1998)			
Telephone - interview offer	Moroccan/m	394	50.5***
In-Person - job offer		62	21.0**
Telephone - interview offer	Moroccan/f	100	42.0
In-Person - job offer		32	18.8
<i>England</i>			
Esmail and Everington (1993)			
Written	Asian/m	12	50.0**
Esmail and Everington (1997)			
Written	Asian/m	29	27.6*
<i>Germany</i>			
Goldberg et al. (1996)			
Telephone - interview offer	Turkish/m	175	18.9
Written		299	9.7
<i>Italy</i>			
Allasino et al. (2004)			
Telephone - interview offer	Moroccan/m	383	53.3
In-Person - job offer		64	21.9
<i>Netherlands</i>			
Bovenkerk et al. (1995)			
Telephone - interview offer	Moroccan/m	112	50.0***
In-Person - job offer		8	100.0***
Telephone - interview offer	Surinamese/m	81	50.6***
Written		157	17.8***
Telephone - interview offer	Surinamese/f	83	43.4***
Written		78	12.8*
Telephone - interview offer	Moroccan/f	74	43.2***
<i>Spain</i>			
de Prada et al. (1996)			
Telephone - interview offer	Moroccan/m	268	47.0***
In-Person - job offer		26	42.3**

In the second part discrimination is measured against the same group, but in highly skilled jobs using written applications instead. The professions tested are medical gymnast, foreign language correspondent, sales assistant, industrial merchant, computer assistant, graphical designer, construction draughtsman and

bank clerk. Blind applications are sent to employers in the Rhine-Ruhr region and in Berlin starting in February 1994. 299 usable cases are obtained from the 2633 sent applications. The net discrimination against Turks is 29 cases or 9.7 percent. Since the critical value is calculated to 11 percent the level discrimination is not statistically significant.

Allosino et al. (2004) apply the ILO methodology in Italy surveying discrimination against first generation Moroccan immigrants without an Italian citizenship. The study is conducted during February to June 2003 in Turin, Rome and in Naples with focus on the three sectors manufacturing industry, construction and services. The vacancies are collected from different newspapers and the subjects apply in a first step by telephone. In the cases where the subjects are invited for interview real persons are actually sent to the interview in the second step. In the first step there are 383 usable tests and the net discrimination is 53.3 percent. In the second step there are 64 usable tests and the net discrimination is 21.9 percent.

Actis et al. (1996) apply a situation test in Spain in order to measure discrimination against Moroccan workers. The study is done on semi-skilled jobs using fictitious national and Moroccan males at the age between 20 and 25 years old. The jobs are collected mainly from newspapers and advertisements during the period in of September 1994 and January 1995 in Madrid, Barcelona and Malaga. The sectors included in the study are hotel/catering, services, construction and industry. At the interview offer stage 268 usable cases are collected resulting in a net discrimination against the Moroccan of 47.0 percent. At the job offer stage the number of usable cases is 26 and the net discrimination is 42.3 percent.

Arriijn et al. (1998) examine discrimination in Belgium against young Moroccan males with Belgian nationality but of foreign descent or ancestry. The survey is conducted on semi-skilled jobs during the period from February 1996 to December 1996 using the ILO method. The Walloon, Flemish and Brussels-Capital regions are considered. The aggregated result contains 394 cases at the interview offer stage and 62 cases at the job offer stage. The net discrimination is 50.5 and 21.0 percent respectively. Further, in the Brussels-Capital region discrimination against females is also studied. 100 usable tests are collected at the interview offer stage and 32 tests at the job offer stage. The discrimination is 42.0 percent and 18.8 percent respectively.

Esmail and Everington (1993) test for discrimination against Asian doctors using written applications and find a net discrimination of 73.3 percent. In 1997 the test is repeated resulting in a net discrimination of 50.0 percent.

4. The data, design and different measures of discrimination

This section describes the choice of occupations, the construction of resumes, and the achievement of the correspondence test. Explanatory variables for discriminatory behavior are also discussed. The experiment was conducted between May 2005 and February 2006. During the period all employment ads in the chosen occupations on the webpage of the Swedish employment agency⁵ were collected. However, ads with no possibility to apply through email were eliminated.⁶ All information contained in the advertisement was saved in order to be able to track any response from the employers. All in all, approximately 3200 resumes were sent to more than 1600 employers during the period.

Callbacks for interviews were received thorough telephone, email or ordinary post and tracked to the corresponding fictitious individual through the database and recorded. To minimize the inconvenience for the employer any invitations for interview was promptly declined. Thereafter the process was terminated. Since high-skilled occupations are included in the study it is difficult to send real persons for interview. First of all it would require a lot of training of those persons and, second, it is often required to bring diplomas to the interview.

4.1 Choice of occupations

The experiment was restricted to 13 job categories in the two major cities of Sweden: Stockholm and Gothenburg. The occupations were chosen to include high and low skilled jobs, jobs with a relative low respectively high ratio of immigrants and females.⁷ In order to make satisfactory progress in the study it was necessary that the demand for labor was high in the chosen sectors. The supply of labor also had to be high enough in the selected sectors; otherwise every applicant would get the job. Table 2 shows the selected occupations.

⁵ AMS, Arbetsförmedlingen

⁶ In Sweden it possible to apply through email in most cases (See.....)

⁷ http://www.scb.se/templates/Product_59071.asp, *Rapport Integration 2003 Bilaga*

Table 2 Occupations included in the experiment

Occupation	Characteristics	
Accounting	Female dominated	Skilled
Business Sales	-	Unskilled
Cleaning	Relative immigrant dominated	Unskilled
Computer professionals	Male dominated	Skilled
Construction	Male dominated	Unskilled
Motor-vehicle drivers	Male dominated	Unskilled
Nursing	Female dominated	Skilled
Preschool Teaching	Female dominated	Skilled
Restaurant	Relative immigrant dominated	Unskilled
Shop Sales	Female dominated	Unskilled
Teaching-upper secondary school	-	Skilled
Teaching-upper level of compulsory school (mathematics/science and language)	-	Skilled

4.2 Construction of resumes

In order to apply for jobs resumes for the fictitious applicants had to be constructed. They had to be realistic but still not belong to any real persons. They should also signal the same level of qualification but still look different to avoid detection. Since the competition from other applicants was considerable the testers had to be well-qualified. To make the resumes still look different the resumes were constructed with different layout and typeface. A number of written applications available on the webpage of the Swedish employment agency⁸ were used as templates. These were adjusted and calibrated in order to signal equal productivity but not appear the same and also to achieve an adequate response rate. For each job category a number of resumes were constructed in order to yield a pool to select resume from at random.

The fictitious individuals consisted of a name, an email address, a telephone number and a postal address. The choice of names was crucial since ethnicity is signaled through the name. In Sweden there is fortunately a clear distinction between typical Swedish names and Arabic names. The most frequent Swedish and

⁸ Arbetsförmedlingen, AMS

Arabic names occurring in Sweden were selected.⁹ From both ethnicities we chose a couple of names to our pool of names in order to avoid any name effects. One email address for each name was registered at a large internet provider.

Applicants belonging to the same ethnic group and living in the same region shared the same telephone number. By that arrangement each telephone call could be tracked to a particular ethnic group and region.

For practical reasons, postal addresses were a part of the written application and not connected to any specific individual. By that construction it was still possible to identify the mail recipient through the name. The addresses were chosen to be recognized as similar and neutral as possible and to not signal any social class. We did not expect many calls for interview through ordinary mail but real addresses were still used to prevent any invitations to be lost or returned to the employer.

Given the fictitious resumes, names, email addresses, telephone numbers and postal addresses jobs were applied for in the following way. For each job vacancy and ethnic group a resume and a name was selected at random which yields a complete resume. Remember that the postal address is a part of the resume and the telephone number is connected to the ethnic group. In addition, each name has a unique email address. The resumes were finally emailed in random order to the employer.

4.4 Descriptive statistics – the results

Table 3 reports the results in the standardized way recommended by Riach and Rich (2002). The last row shows the aggregated results and from the second column it can be read that applications to 1,614 vacancies were sent during the period May 2005 and February 2006. The third column shows that in 1087 cases neither individual was invited for interview. The remaining 527 cases (column 4) where at least one subject was invited for interview are the number of usable tests. In 240 cases (column five) both individuals were invited. In these cases there is no reason to believe that discrimination has occurred. In 221 cases (column 6) only the majority was invited and in 66 cases (column 7) only the minority was invited. Hence, net discrimination against the minority, as defined by ILO, can be read from the last two columns and is 155 cases or 29

⁹ SCB, Statistiska centralbyrån

percent.¹⁰ Table 3 shows further the same division of data for each of the 13 job categories separately. In appendix, Table 4 and Table 5 shows the results divided by region. One could also use other measures of discrimination as “equal treatment” and “total discrimination”. “Equal treatment” is calculated as the sum of neither invited and both invited divided by the number of applications sent, which occurs in 82 percent of the cases. “Total discrimination” is similar to the ILO definition but instead of subtracting the minority from majority cases they are added, which gives a measure of 54 percent. Hence, depending on the measure used discrimination is either strong or weak.

Table 3 – Aggregated results

							Net Discrimination	
	Jobs	Neither invited	Usable tests (1)	Equal treatment (2)	Discrimination against minority (3) No.	Discrimination against majority (4) No.	(3)-(4) No.	[(3)-(4)]/(1) %
Shop Sales	200	167	33	5	24	4	20	60,6
Accounting	186	155	31	10	14	7	7	22,6
Motor-vehicle drivers	78	59	19	6	13	0	13	68,4
Teaching-upper level of compulsory school (mathematics and science)	42	16	26	17	7	2	5	19,2
Restaurant	140	128	12	3	8	1	7	58,3
Teaching-upper secondary school	64	41	23	10	11	2	9	39,1
Computer professionals	106	71	35	9	14	12	2	5,7
Teaching-upper level of Compulsory school (language)	60	26	34	9	19	6	13	38,2
Construction	64	44	20	7	12	1	11	55,0
Nursing	150	95	55	30	20	5	15	27,3
Cleaning	62	57	5	1	4	0	4	80,0
Business Sales	278	164	114	57	39	18	21	18,4
Preschool Teaching	184	64	120	76	36	8	28	23,3
Total	1614	1087	527	240	221	66	155	29,4

5. Empirical analysis – who discriminates

We have extended previous studies, as reported in section 3.2, by interviewing those employers that actually invited at least one of the applicants for a job interview. We then asked questions on the size of the firm, whether public or private enterprise, whether they worked with equal rights, how many immigrants that are employed etc. These data have been collected but not yet analyzed.

¹⁰ This implies that the ILO definition relies on the assumption of only discrimination against the minority and when only the minority is chosen this is due to random exclusion/events. Hence, not all cases when only the majority is chosen is treated as discrimination but rather the difference of majority chosen minus minority chosen divided by the number of usable cases. Therefore the concept “net discrimination” is used.

6. Simulating the native-immigrant unemployment gap

The standard job search model presented in Mortensen (1986) can be used to simulate to what extent the observed level of discrimination can explain the native-immigrant unemployment gap.¹¹ The focus of the job search model is on an unemployed person who strives to maximize the present value of lifetime income. The person knows the distribution of wages offered but not where offers are located. For simplicity, we assume that search intensity is the same among natives and immigrants.¹² Hence, the job searcher can not affect how often wage offers arrive (or both groups can affect it in the same way). The job searcher decides an acceptance wage that maximizes the present value of lifetime income. He continues to search until a satisfactory job offer is received. One can incorporate discrimination into this model by assuming that the job offer arrival rate differ between the groups. If a significant share of employers are reluctant to hire some immigrant groups, this can be seen as a decrease in the job offer arrival function.¹³ In this type of job search model the escape rate out of unemployment is $\theta = \lambda * \eta$, where λ is the function for job/wage offer arrivals and η the job/wage offer acceptance rate. We assume that η is the same among immigrants and natives. Further, the expected duration of unemployment, $E[D]=1/\theta$. This is the case when the hazard rate out of unemployment follows an exponential function, i.e. having a constant hazard over the spell/duration. Finally, the unemployment rate, for each group $i=N$ or I , can be calculated as $u_i = f * E[D_i]$, where f is the inflow rate into unemployment, calculated as the inflow in persons divided by the number of persons in the labor force. We assume that the inflow rate is the same among immigrants and natives, i.e. once employed employers do not discriminate against immigrants (no discrimination in firing). Hence, we assume that the groups are equal in all other respects except the job offer arrival rate/discrimination. We can then easily show that the relative

¹¹ How discrimination affects an unemployed person engaged in job search has been formalized in an increasing number of articles during the last twenty years. This literature focuses on equilibrium effects rather than on the (partial) effect on individual job search strategies; see for instance Altonji and Blank (1999). The purpose of these articles has been to extend the Becker (1957) model of discrimination, and to show that wage differentials due to discrimination exist in equilibrium when frictions are included into the Becker model.

¹² This also seem to be the case in reality as shown by Olli Segendorf (2005).

¹³ Naturally, employers' willingness to hire may also decline due to changing preferences among customers or other employees. Employers could also be acting on expected productivity differentials.

unemployment rate for immigrants versus natives (u_I/u_N) is equal to λ_I/λ_N , the relative rate of wage offer arrivals.¹⁴

Information on f , u_N , u_I , and $E[D_N]$ are taken from the Labor Force Surveys. Using this information the predicted unemployment rate for natives when using the lower rate of wage offer arrivals found for the discriminated group, which is found in the empirical section, can be calculated. Table 4 show that the predicted unemployment rate is 10.1 percent when natives are given the call back rate of the minority group. This also implies that the relative unemployment rate is 1.5. Hence, the lower call back rate due to discrimination can, at most, account for one third of the observed native-immigrant unemployment gap. Instead there must exist other factors being more important for hiring of immigrants.

Table 4. Simulation of unemployment for immigrants using the results from section 4.

	u_i	λ_i	η	θ	$E[D_i]$	f
Natives (LFS)	0.066	0.29	0.131	0.038	26.4	0.0025
Immigrants (LFS)	0.172	-	-	-	-	-
Prediction - Natives	0.101	0.19	0.342	0.025	40.3	0.0025

Source: Swedish Labor Force Surveys (u_i , $E[D_i]$, f) and own calculations.

As found in Olof Åslund. When being asked why immigrants do not get jobs, employment agency officers report that lack of different productive skills as being most important, with ethnic discrimination only in sixth place. These results indicate the same conclusion. As long as there are enough non-discriminatory firms discrimination will not manifest itself into radically higher unemployment rates for discriminated groups.

7. Conclusion

We find.....

¹⁴ Our simulation is not affected by at what rate the two groups were invited for interview since any proportional effect will cancel out.

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Appendix

Table 4 – Results Stockholm

	Jobs	Neither invited	Usable tests (1)	Equal treatment (2)	Discrimination against minority (3) No.	Discrimination against majority (4) No.	Net Discrimination	
							(3)-(4) No.	[(3)-(4)]/(1) %
Shop Sales	154	134	20	2	15	3	12	60,0
Accounting	160	131	29	9	13	7	6	20,7
Motor-vehicle drivers	64	48	16	6	10	0	10	62,5
Teaching-upper level of compulsory school (mathematics and science)	38	14	24	16	6	2	4	16,7
Restaurant	112	102	10	3	7	0	7	70,0
Teaching-upper secondary school	58	37	21	9	10	2	8	38,1
Computer professionals	84	55	29	6	12	11	1	3,4
Teaching-upper level of Compulsory school (language)	48	21	27	8	14	5	9	33,3
Construction	42	26	16	5	10	1	9	56,3
Nursing	120	73	47	29	14	4	10	21,3
Cleaning	44	41	3	1	2	0	2	66,7
Business Sales	174	102	72	38	21	13	8	11,1
Preschool Teaching	118	43	75	43	27	5	22	29,3
						0		
Total	1216	827	389	175	161	53	108	27,8

Table 5 Results Gothenburg

	Jobs	Neither invited	Usable tests (1)	Equal treatment (2)	Discrimination against minority (3) No.	Discrimination against majority (4) No.	Net Discrimination	
							(3)-(4) No.	[(3)-(4)]/(1) %
Shop Sales	46	33	13	3	9	1	8	61,5
Accounting	26	24	2	1	1	0	1	50,0
Motor-vehicle drivers	14	11	3	0	3	0	3	100,0
Teaching-upper level of compulsory school (mathematics and science)	4	2	2	1	1	0	1	50,0
Restaurant	28	26	2	0	1	1	0	0,0
Teaching-upper secondary school	6	4	2	1	1	0	1	50,0
Computer professionals	22	16	6	3	2	1	1	16,7
Teaching-upper level of Compulsory school (language)	12	5	7	1	5	1	4	57,1
Construction	22	18	4	2	2	0	2	50,0
Nursing	30	22	8	1	6	1	5	62,5
Cleaning	18	16	2	0	2	0	2	100,0
Business Sales	104	62	42	19	18	5	13	31,0
Preschool Teaching	66	21	45	33	9	3	6	13,3
Total	398	260	138	65	60	13	47	34,1