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Employer Attitudes, the Marginal Employer and the Ethnic Wage Gap^{*}

by

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Abstract: This study explores the link between employer attitudes toward ethnic minorities and the ethnic wage gap in the Swedish labor market. The analysis proceeds in two steps. First we conduct a field experiment on hiring in order to establish that a randomly selected employer is more likely to discriminate a minority job applicant in regions where the average employer has more negative attitudes. This analysis concludes that ethnic minority workers have an incentive to sort away from the most prejudiced employers in the labor market. If such sorting occurs the relative wage for minority workers will, according to Becker's theory of discrimination, be determined by the attitudes of the marginal employer. Hence, in the second step we contrast the impact of the attitudes of the marginal employer with the impact of the attitudes of the average employer on the ethnic wage gap. We find evidence for Becker's argument in that the regional ethnic wage gap is only affected by the attitudes of the marginal employer, but not by the attitudes of the average employer in the region. This holds especially for low skilled occupations.

JEL classification: J64, J71

Key words: field experiments on hiring, employer discrimination, negative attitudes, ethnic wage gaps, regional variation

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1. Introduction

In many European countries, including Sweden, it has been observed that ethnic minorities perform worse in the labor market compared to the native population. Negative attitudes among employers toward minority workers have been suggested as one factor that potentially can explain part of the ethnic gaps that are observed in the labor market. However, very few studies have jointly analyzed attitudes and labor market outcomes in order to establish this link.¹ Typically, researchers have instead focused on either conducting surveys in order to measure attitudes or attempted to measure ethnic wage and employment gaps in the labor market.

In the present study, we explore the attitude-discrimination link by analyzing the consequences of negative attitudes among employers for the ethnic wage gap in the Swedish labor market. We do this by taking into consideration one of Becker's (1957) important insights, namely, the distinction between the attitudes of a randomly selected employer and the attitude of the marginal employer – the employer that determines the relative market wage for minority workers. This distinction emerges if minority workers sort away from the most prejudiced employers in the labor market. When sorting occurs the market wage for minority workers will, according to Becker's model, be determined by the most prejudiced employer that still hires some minority workers, i.e. the marginal employer.

In order to empirically analyze the consequences of negative attitudes for the ethnic wage gap we proceed in two steps. In the first step, we examine if there exist an incentive for minority worker to sort in accordance to Becker's model. This is done by analyzing

¹ A recent study is Charles & Guryan (2008) and a study in the Swedish context is Waisman & Larsen (2008).

hiring discrimination at a randomly selected firm. More specifically, we conduct a field experiment where fictitious job applications – which are randomly assigned either a typical Swedish or ethnic minority name – are sent to employers who advertise for labor. This approach should be able to identify discrimination since by construction of the experiment the researcher observes the same variables of the applicants as the employers do. Therefore a difference in the probability of being invited to a job interview can only be because the employers act on the name of the job applicant. It is this difference in probabilities that quantifies the degree of discrimination.

An incentive for minority workers to sort away from the most prejudiced employers requires a link between employers' attitudes and the degree of ethnic discrimination such that more prejudiced employers also are more likely to discriminate. The existence of such a link is a basic assumption in Becker's model, which we test empirically by exploiting regional variation in attitudes as well as in the degree of ethnic discrimination measured in the field experiment.

In the second step we analyze the consequences of negative attitudes among the employers for the ethnic wage gap in Sweden.² We hypothesize that the attitude of the marginal employer is more important for the ethnic wage gap than the attitude of the average employer. This is expected if minority workers sort away from the most prejudiced employers in the labor market. We construct a measure of the attitude of the marginal employer by combining the regional distribution of attitudes and the share of minority workers in the region. Thereafter the hypothesis is tested by relating average attitudes as well as the attitude of the marginal employer to the ethnic wage gap at the regional level.

² This step basically replicates the approach used by Charles & Guryan (2008), but for the Swedish case.

The result of the field experiment shows that applicants with a typical Middle Eastern name have on average approximately ten percentage points lower probability of being invited to an interview compared to applicants with a typical Swedish name.³ More interestingly, the results also show that the estimated level of discrimination is correlated with attitudes at the regional level such that employers are more likely to discriminate in regions where attitudes toward ethnic minorities are more negative than average. This supports the existence of a link between prejudice in the public, employer prejudice and employer discrimination as in Becker's model. In light of this result minority workers have an incentive to sort away from the most prejudiced employers, since these employers are less likely to hire minority workers.

The results of the second part of the analysis confirm that it is the attitude of the marginal employer that is important for the ethnic wage gap, and not the attitude of the average employer. This distinction is precisely what to expect if minority workers sort away from the most prejudiced employers in the labor market. In summary, our findings indicate that minority workers not only have an incentive to sort away from the most prejudiced employers but also that they actually sort in accordance to the incentive.

The remaining of this paper is organized as follows. Section 2 reviews some previous studies in this area, while Section 3 presents the attitude measure being used in the current study. Section 4 then analyses the association between the attitude measure and the degree of discrimination found in the field experiment, while Section 5 analyses the association between the attitude measure and the ethnic wage gap. Section 6 closes the article with a discussion of the results.

³ This finding is in line with previous Swedish field experiments on ethnic discrimination in hiring, see Carlsson & Rooth (2007), Carlsson (2010) and Bursell (2007)

2. Previous studies

The second step of the analysis in the current study, that is, when employer attitudes are related to the ethnic wage gap at the regional level, is inspired by Charles & Guryan (2008). They test and confirm the predictions from Becker's (1957) seminal work on White-Black wage differentials and employer prejudice by utilizing regional variation in population attitudes. Their focus is especially on the attitude of the marginal employer and not on the attitude of the average employers in a region. This is motivated by the fact that in Becker's original model Blacks are assumed to sort away from the most prejudiced employers, which implies that the relative wage for Black workers will be determined by the attitude of the marginal employer. To get an intuition of how this works, assume initially that the supply of Black workers is relatively small (S_1 in Figure 1). In this situation there are enough non-prejudiced employers to hire all black workers – the marginal employer is not prejudiced – so Blacks and Whites will have equal wages.

*** Figure 1 about here ***

Now, instead imagine a situation where there is relative large supply of Black workers (S_2 in Figure 1). In this case there will not be enough non-prejudiced employers to hire all black workers – the marginal employers is prejudiced. Thus, for the market to clear in this case the wages for Blacks have to be lower than for Whites. These two situations illustrate that when Black workers sort to the least prejudiced employers it is the attitude

of the marginal employer that determines the relative wage for Blacks, while the share of employers with negative attitudes not necessarily is associated with the relative wage.

A further implication of Becker's model concerns how changes in attitudes among employers effect the relative wage for Black workers. Suppose that a shift of the relative demand curve occurs from D to D' such that the negative attitudes increases among those likely to be the marginal employer. Then the relative wage for Black workers is expected to decrease. However, the relative wage will not be affected by a change in the attitude of the average employer if the attitude of the marginal employer remains the same.

Charles & Guryan (2008) relate wage differentials between White and Black workers to employer prejudice at the state level in the U.S. One of their main results is that the attitudes of the marginal employer significantly and negatively influences that White-Black wage gap, while they do not find such an effect for the average level of attitudes among employers.

Another related study is Waisman & Larsen (2008) who take a somewhat different view on sorting compared to the current study. Instead of focusing on ethnic market wage differentials – which may well be affected by sorting of minority workers – they attempt to remove the effect of geographic sorting by taking advantage of a Swedish refugee settlement policy, which basically implies random placement of refugees in regions. It is worth mentioning that sorting between employers within a region is still possible in the study. They find that negative attitudes increases the ethnic wage differential and also influences future mobility decisions of refugee immigrants away from more discriminating regions.

Rooth & Aslund (2005) utilize the change in attitudes toward ethnic minorities following the terror attacks in New York on September 11, 2001, as a natural experiment to measure if a negative attitude has an affect on the labor market opportunities of minorities. They use this event as an exogenous attitude shifter of average attitudes and find that the relative probability of employment for minorities did in fact not decrease after 9/11. One possible explanation for this finding is that the attitudes of the marginal employer might have been unaffected by 9/11. Perhaps only the employers that already had negative attitudes became more negative after 9/11.

Rooth (2010) also analyze the relationship between attitudes and discriminatory behavior, but at the firm level. In his study, recruiters from a sample of firms were involved in two experiments: a field experiment on discrimination in hiring and an experiment that measures their implicit attitudes as an IAT-score. This study finds that recruiters with higher IAT-scores – which imply more negative implicit attitudes – are less likely to invite applicants with a typical Middle Eastern name to a job interview compared to applicants with a typical Swedish name. Hence, this study finds evidence for an existing link between employer attitudes and discrimination in hiring at a randomly selected employer.

3. The attitude measure

To construct a measure of the employers' attitudes we use data obtained from FSI, which is a Swedish research institute that, among other things, measures attitudes of the Swedish population in various dimensions.⁴ Of course it would have been an advantage if

⁴ This is also the data being used by Aslund and Rooth (2005).

we had survey data specifically on the employers' attitudes and not only on the attitudes of the general public. However, we find it quite likely that it is the same mechanisms that are the basis of the employers' attitudes and the attitudes of the general public in a region. This motivates the use of the attitudes of the general public as an approximation of the employers' attitudes in a region.

The attitude survey that we utilize is conducted each year on a random sample of individuals in the population. By merging the years 2000 to 2008, a sample consisting of 19,555 respondents was obtained. The attitude measures that will be used in the current study is constructed from the following question (own translation from Swedish): "What do you think of the immigrants that we have received as a contribution to the Swedish population?". The possible answers are: 1) "Very valuable", 2) "Quite valuable" 3) "Not very valuable", 4) "Not valuable at all", and 5) "Unsure, do not know".⁵ For each respondent we also have information on in which municipality he or she lived at the time of the survey. This information is used to construct two different attitude measures at the municipality level. The first measure is defined as the share in a municipality that responded alternative 4 – "Not valuable at all", while the second measure is defined as the share that responded either 3 – "Not very valuable" – or 4 – "Not valuable at all". Figure 2 and 3 show the distribution of these two measures for the 290 municipalities in Sweden.⁶

*** Figure 2 and 3 about here ***

⁵ The survey also contained other question about immigrants and immigration to Sweden. However, these questions were more about immigration legislation, while the chosen question is about the immigrant group themselves.

⁶ The correlation coefficient for the two measures is 0.82 and highly significant.

4. Hiring discrimination in the field experiment

The field experiment on hiring – also being referred to as correspondence testing – was conducted within a large ethnic discrimination project. It is a type of experiment where fictitious job applications are sent to real job openings and ethnicity is being signaled by the name of the job applicant. Early in this project it was decided that the names of the job applicants would be either a typical Swedish or a typical Middle Eastern male name. The motivation for choosing the Middle Eastern minority group is that surveys indicate that the perceived level of discrimination is worst against individuals with a Middle Eastern background (see Lange, 2000; FSI, 2004).

In this kind of experiment there can by construction be no sorting of applicants since the names of the applicants are randomly attached to the applications by the researcher. Thus, the measured level of discrimination in this kind of experiment is what the level of discrimination would be in the market if applicants with a typical Swedish and a typical Middle Eastern name applied for the same jobs.⁷ By analyzing if this measure of discrimination co-varies with attitudes over municipalities it is possible to establish whether there exists an incentive for applicants with a typical Middle Eastern name to sort away from the most discriminating employers in the labor market.

⁷ It should be noted here that not allowing for sorting is one of the main criticisms James Heckman (1998) points out when relying on the results of situation testing to inform on the level of ethnic discrimination in the labor market.

4.1. Sampling

During the experiment which was conducted from March 2007 to October 2007 all employment advertisements in thirteen selected occupations⁸ found on the webpage of the Swedish employment agency were collected.⁹ For these advertised jobs, 5,657 applications, 2,837 with a typical Swedish name and 2,820 with a typical Middle Eastern name, were sent to 3,325 employers. All applications were sent by email; a clear majority of employers posting vacant jobs at this site accept applications by email. It can also be mentioned that we applied to jobs all over Sweden (most experiments of this kind are restricted to a few specific labor market areas). But for construction purposes, the applicants always signaled living in one of the two major cities of Sweden, Stockholm or Gothenburg, even when they applied for jobs in other areas of Sweden. Callbacks for interview were received via telephone (voice mailbox) or e-mail. To minimize inconvenience to the employers all invitations to a job interview were promptly declined.

4.2. Generating applications

One of the most important steps in conducting the field experiment was to create realistic job applications that fulfilled their purpose. Typical correspondence studies vary only the name put in the application (see Rich and Riach, 2002). The current field experiment uses a more general approach by also randomly varying other attributes. However, the starting point in this field experiment was similar as for the standard correspondence study. The

⁸ The thirteen included occupations were: shop sales assistants, cleaners, construction workers, restaurant workers, mechanics, motor-vehicle drivers, accountants, primary school teachers (math/science), primary school teachers (language), high school teachers, business sales assistants, computer professionals, and nurses.

⁹ According to labor related laws all new vacancies should be reported to the Swedish employment agency. However, these laws are not enforced and all vacancies are therefore not reported. Still it is the one site where most vacant jobs are to be found.

first step was to construct a fixed frame, without content, for the resumes that determined typeface, layout and number of pages for the resumes. When constructing this frame, we took advantage of applications available on the webpage of the Swedish employment agency and our experience from previous conducted field experiments, see Carlsson and Rooth (2007), Rooth (2009), and Carlsson (2010, 2011). In the end, all applications consisted of two pages: a personal letter on one page and a CV on a second page.

4.3 Descriptive results

The descriptive results of the field experiment are summarized in Table 1. 2,837 applications with a typical Swedish name were sent, which in 762 cases resulted in an invitation to an interview. This corresponds to a callback rate of 26.9 percent. The corresponding figures for applicants with a typical Middle Eastern name are 2,820, 491, and 17.4, respectively. Hence, on average, there is a statistical significant difference of 9.5 percentage points in the callback rate favoring applicants with a typical Swedish name.

*** Table 1 about here ***

This difference is in line with Carlsson and Rooth (2007) and Bursell (2007), which also used the correspondence study methodology to measure ethnic discrimination in hiring. Carlsson (2010) found a larger ethnic difference in the callback rate, a potential explanation is that this experiment used applications signaling more qualified applicants, which helped job applicants with a typical Swedish name more.

4.4 Attitudes and discrimination

In order to analyze whether negative attitudes against applicants with a typical Middle Eastern name affects the degree of discrimination we exploit regional variation in attitudes and in the ethnic difference in the probability of being invited to an interview. Using all 5,637 applications, the following equation was estimated using a Probit model (reporting marginal effects from the `dprobit` command in Stata and clustering standard errors on job advertisement level).¹⁰

$$Callback_i = \alpha + \beta_1 Minority_i + \beta_2 \left[\begin{array}{c} \text{Attitudes in} \\ \text{municipality} \end{array} \right]_i + \beta_3 \left[\begin{array}{c} \text{Attitudes in} \\ \text{municipality} \end{array} \right]_i Minority_i + \varepsilon_i \quad (1)$$

$Callback_i$ is an indicator that equals one if sending application i resulted in a job interview offer, α is the intercept for applicants with a typical Swedish name, while β_1 is the difference in the intercept for applicants with a typical Middle Eastern name, β_2 is the slope coefficient of the attitude variable for applicants with a typical Swedish name, and, finally, the parameter of interest is β_3 , which measures the difference in the slope coefficient of the attitude variable for applicants with a typical Middle Eastern name. In other words, the parameter of interest β_3 reflects if attitudes toward ethnic minorities in the municipality influences the probability of being invited to an interview for applicants with a typical Middle Eastern name, compared to applicants with a typical Swedish name.

¹⁰ Estimating a linear probability model resulted in almost identical results.

The results for the first model, where the attitude measure is a continuous variable measuring the share of employers with negative attitudes in the municipality, are presented in Table 2. A negative attitude is in the first two columns of the table defined as the share in a municipality answering alternative three or four, while in the last two columns a negative attitude is defined as the share in a municipality answering alternative 4. The interaction variable between the share with negative attitudes in a municipality and the ethnic minority dummy variable constitute the explanatory variable of interest. Equation (1) is estimated both for all fourteen occupations as well as for only low and high skilled occupations.

*** Table 2 about here ***

As can be seen from the third row, the parameter estimate of the variable of interest is negative but only significant in one case. However, we suspect that there is scope for measurement error in the attitude measure since there are very few respondents in some municipalities. Therefore we proceed by constructing a dummy variable as our measure of attitudes. This dummy is constructed by simply dividing the municipalities into two groups, depending on whether the share of respondents with negative attitudes in the municipality is below or above the Swedish average. This should reduce the problem with measurement error since most municipalities now is expected to be correctly classified as being above or below the average.

*** Table 3 about here ***

Equation (1) is then re-estimated with this newly constructed dummy variable and the results are presented in Table 3. The last row shows that attitudes are, especially for low skilled occupations, significantly related to the ethnic difference in the probability of being invited to an interview such that applicants with a typical Middle Eastern name are discriminated to a larger extent in municipalities where the employers have more negative attitudes.

To sum up, our results show that there is a link between public prejudice, employer prejudice and discriminatory behavior when hiring. Therefore minority workers have an incentive to sort away from the most prejudiced employers. In the next section, we analyze the consequences of prejudice among employers for the ethnic wage gap by taking into account the possibility that minority job applicants may sort away from the most prejudiced employers.

5. The ethnic wage gap

This section in principle replicates the research design used by Charles and Guryan (2008) but for the Swedish case. The analysis is performed on public micro data on wages obtained from Statistics Sweden and on the same attitude measure that was utilized in the previous section. As before, the identification strategy is to exploit regional variation in the variables of interest, which in this section are the ethnic wage differential and the employers' attitudes towards minority members.

To start with, the share of employers with negative attitudes will be related to the ethnic wage gap at the municipality level. However, as explained earlier and motivated by Becker's theory, if sorting of minority workers occurs between employers a more

relevant attitude measure for the relative wage of minority workers should be the attitude of the marginal employer. Motivated by this and our finding in the previous section that there actually is an incentive for minority workers to sort away from the most prejudiced employers we proceed by testing the hypothesis that the attitude of the marginal employer is more important for the ethnic wage gap than the share of employers with negative attitudes.

Before turning to the analysis, notice that our discussion makes the implicit assumption that there is a cost associated with moving across municipalities. This cost explains why we observe variation in the relative wage for minority workers and in the attitude of the marginal employer across municipalities. To understand this, suppose that moving across municipalities instead was costless. Then municipalities with higher relative wages would attract more minority workers. This would increase the supply of minority workers and the supply curves would shift to eventually equalize the relative wage across municipalities. In this situation, the last employed minority worker would meet the same employer attitude in all municipalities, namely, the attitude of the marginal employer. This shows that without a cost being associated with moving across municipality borders there would be no variation in the relative wage for minority workers and in the attitude of the marginal employer at the municipality level.

5.1 Data

The data consists of Swedish population data for 2003, taken from the registers at Statistics Sweden. We restrict the analysis of the ethnic wage gap to study only males aged 35-45 (more than 500,000 individuals), since these individuals are likely to have

stable income from work. The analysis is further restricted to study only individuals that are either native Swedes or have a non-Nordic foreign background. An individual with a non-Nordic foreign background is defined as a person who either immigrated from a non-Nordic country more than 15 years ago (13,000 individuals) or is born in Sweden but has at least one parent born outside Scandinavia (24,000 individuals). This choice of ethnic groups is chosen in order not to confuse ethnic wage gaps with immigrant wage gaps, with the latter being more difficult to interpret and explain.

A potential issue is that our measure of income is annual earnings, while hourly wages would be desirable in order to analyze the ethnic wage gap. However, we argue that the variation in annual earnings closely mimics the (unobserved) variation in hourly wages. The argument is based on the fact that individuals with higher annual earnings are more likely to have similar amounts of time worked (hours and weeks). Therefore, an estimate of the ethnic wage gap based on only annual earnings above a certain threshold should be more accurate and more close to an estimate of the wage gap based on hourly wages.¹¹ With this in mind, we estimated the ethnic earnings gap for only annual earnings above 100,000 SEK and the result was very similar as when using the full data. This suggests that annual earnings to a large extent actually co-varies with hourly wages.

In the regression analysis the dependent variable of interest will be log earnings (which includes the self-employed). Before turning to the empirical analysis it is interesting to note that the raw ethnic earnings gap in our subsample is approximately -13 percent and that the largest ethnic wage differentials are found among low skilled

¹¹ Antelius and Björklund (2000) show, for Swedish circumstances, that if a threshold of 100,000 SEK (approximately 10,000 euro) is used when analyzing annual earnings based on tax records, one receives a return to education similar to the one obtained from analyzing hourly wages.

occupation. For low skilled occupations the ethnic wage gap is on average about -23 percent while it is on average only about -4 percent for high skilled occupations.

5.2 Empirical analysis and results

Our main hypothesis to be tested in this section is that the attitude of the marginal employer in a municipality is more important to the ethnic wage gap compared to the share of employers with negative attitudes. Support for the hypothesis is expected if minority members sort away from the most prejudiced employers.

As regards the share of employers with negative attitudes, we will only report the results for the second measure that was discussed earlier, namely, the share of individuals responding alternative 3 or 4 to the question in the survey. Using the first alternative – the share that responded alternative 4 to the question – gives almost identical results.

To approximate the attitude of the marginal employer in a municipality the distribution of answers – where the possible answers go from 1 to 4 – is combined with the share p of individuals with foreign background. More specifically, the attitude of the marginal employer is defined as percentile p in the answer distribution. Since it turns out that for all municipalities percentile p is either answer 1 or 2 to the question, this measure is transformed into a dummy variable that equals zero if the attitude of the marginal employer is alternative 1 and one if the attitude of the marginal employer is alternative 2. Note that by this construction it is likely that this attitude measure varies differently across municipalities compared to the share of employers with negative attitudes. In fact, it turns out that the correlation between the two measures is quiet low ($r=.14$).

The results of the regression analysis are reported in Table 4. Besides the variables for which we report point estimates, all models also include an ethnic dummy variable and control for age, years of schooling, and the principle orientation of the education. Of particular interest are the interaction effects between the attitude measures and the ethnic dummy variable. The first specification analysis whether the share of employers with negative attitudes is related to the ethnic wage gap. Row 3 in the first column of Table 4 shows that the point estimate of the interaction variable between the share of employers with negative attitudes and the ethnic dummy variable is negative but not significant when all occupations are included in the analysis. Next, the corresponding analysis is performed but for the attitude of the marginal employer. As can be seen from the last row of the second column this attitude measure is significantly and negatively related to the ethnic wage gap. The interpretation of the point estimate is that minority workers have ten percent lower wages compared to majority workers in municipalities where the marginal employer answered alternative 3 as opposed to alternative 4. Finally, when the two attitude measures are simultaneously included in the regression it is according to Becker's model expected that only the attitudes of the marginal employer is negatively correlated with the ethnic wage gap and not the share of employers with negative attitudes. This is precisely what we find as is evident from the figures in Column 3.

*** Table 4 about here ***

As mentioned earlier, the raw ethnic wage gap was almost non-existent for high skilled occupations while it was substantial for low skilled occupations. Motivated by this

observation we proceed by separately performing the previous analysis for high and low skilled occupations, respectively. The results for high skilled occupations are reported in column 4, 5, and 6. As can be seen from the point estimates, the same pattern as for all occupation emerges but the impact of the attitude of the marginal employer is much weaker, about half the size of what was found for all occupations. In contrast to this, column 7, 8, and 9 reveal that for low skilled occupation the attitude of the marginal employer has a larger influence on the ethnic wage gap compared to what was found for all occupations. In both cases the point estimate of the share of employers with negative attitudes remains non-significant. In summary, the results in this section are similar to what Charles & Guryan (2008) find for the U.S. Before turning to the discussion, a number of robustness checks is performed in the next section.

5.3 Sensitivity analysis

In this section we attempt to address the possibility that the attitude variable is endogenous. Endogeneity in our analysis can in principle arise as 1) a variable at the municipality level that is not included in the analysis and simultaneously determine attitudes and the ethnic wage gap, 2) an unobserved variable of the minority which is correlated both with attitudes and with the ethnic wage gap at the municipality level, and 3) measurement error in the attitude variable. Endogeneity due to simultaneity or unobserved variables could bias the estimates in either direction while measurement error in the attitude measure would lead to an underestimation of the effect that attitudes have on the ethnic wage gap. In an attempt to address the problem with simultaneity and unobserved variables we start by including control variables in the analysis for the factors

that we believe might lead to this kind of endogeneity. To further deal with simultaneity and unobserved variables we instrument the attitude measure, which also should reduce the potential problem with measurement error in the attitude variable.

Controlling for municipality characteristics

Perhaps the most obvious variable that might cause simultaneity bias is the level of unemployment in a municipality. It does not seem completely unrealistic that attitudes towards the minority to some extent is driven by the level of unemployment. The existence of such a link is problematic for the analysis if the level of unemployment also determine the ethnic wage gap. But that may well be the case, since minority workers on average are less attached to the labor market and as a consequence might have less opportunity to obtain a higher wage. We address this potential issue by directly controlling for the share of unemployed in the municipality in the regressions.

In an attempt to deal with the problem of unobserved characteristics of minority workers, we add further control variables in the regression analysis. The goal is to control for average differences in the unobserved skills that are correlated with the attitude measure at the municipality level. Such average differences may arise if minority workers sort across municipalities. In order to deal with bias of this kind we add the following control variables at the municipality level (labeled *characteristics of the minority population* in the tables): *the share of immigrants from outside the EU, the share of immigrants from outside the EU that are employed, the share on income support among the foreign born, and the share of refugees among the immigrants.*

A final control variable – the share of minority individuals in the municipality – is added to the analysis in an attempt to handle two potential issues. Firstly, the attitude of the marginal employer might partly be correlated with this variable and therefore the attitude of the marginal employer might capture something related to the share of minority individuals in the municipality.¹² Secondly, adding this variable might also control for some unobserved variables of the minority.¹³

Panel a) in Table 5 presents the results from re-estimating the regressions for all occupations with the discussed control variables added.¹⁴ As can be seen, the results are very similar to before: the share of employers with negative attitudes is not associated with the ethnic wage gap while the coefficient of the attitudes of the marginal employer remains negative and strongly significant.

*** Table 5 about here ***

In Table A1 and A2 (panel a) in Appendix A the analysis is repeated for low and high skilled occupations, respectively. The results basically confirm what was found in the main analysis, namely, that the attitude of the marginal employer is most important for the

¹² Since the attitude of the marginal employer might capture something related to the share of minority individuals in the municipality in a non-linear way we chose to control for this variable in a flexible way, using four dummy variables that indicates which quartile of municipalities the share of minority individuals belongs to.

¹³ Minority members might have poorer unobserved characteristics compared to natives in municipalities with lower/higher shares of minority members. This could lead to biased estimates if attitudes at the same time is more negative in such municipalities. One can for example imagine a situation where there is positive selection of minority members based on some (partly unobserved) characteristics out from municipalities with a large share of minority members. At the same time, it might be precisely in these municipalities where attitudes towards the minority is most negative. Controlling for the share of minority members in the municipality is an attempt to deal with potential correlations of this kind.

¹⁴ As before, all regressions in this section include an ethnic dummy variable as well as control variables for age, years of schooling and the principal orientation of the education.

ethnic wage gap among low skilled occupations, where the largest raw ethnic wage gap also was found.

Instrumenting the attitude measure

Even though we have added control variables in an attempt to solve the potential problems with simultaneity and omitted variables, there might still be municipalities with more negative attitudes that also have other characteristics that we do not observe, which affects wages more negative for minority workers. In this section we try to address this fact and also potential measurement error in the attitude variable by instrumenting the FSI attitude measure.

Our instrument variable consists of an alternative attitude measure, which was constructed by taking advantage of a survey conducted from 1979 to 1985 by Stiftelsen för Opinionsanalyser (SND 099, Göteborg University, henceforth SND). The validity of this instrument mainly relies on two factors. Firstly, regarding those municipality characteristics that we believe are problematic, there should be weak correlation between the value of the variable today and the value more than 25 years ago when the SND survey was conducted. The kind of municipality characteristics that we are mostly concerned about are those that are related to the composition of the minority population in a municipality (and as a result potentially also to their unobserved skills). Fortunately, it seems quite likely that the municipality characteristics that we are worried about in fact are quite different today compared to more than 25 years ago, since the immigration pattern to Sweden has changed considerably after 1985.¹⁵ Secondly, attitudes at the

¹⁵ Refugees have dominated immigration since after 1985 (Statistics Sweden, 2004)

municipality level has to, at least to some extent, be persistent over time. This appears to be the case as will be evident when the results are presented.

The SND survey data was collected as five cross-sectional mail surveys, each time sent to around 2,000 individuals aged 17-80. By adding the answers from the five surveys we obtained in total 11,539 answers. The relevant question for our purpose is: How important do you think less immigration is? The answering alternatives were: 1) very important, 2) quite important, 3) not very important, 4) not important at all (fine now), 5) better with more immigrants, 6) hesitant and 7) no answer.

We constructed the instrument variables from answering alternatives 1 to 5 in the SND data, which are the alternatives that are possible to rank. As instrument for the share of employers with negative attitudes the share that responded alternative 1 in the SND data was used. Regarding the instrument for the attitude of the marginal employer, this variable was constructed in a similar way as for the FSI data, by combining the distribution of answers of the question – now using the SND data – with the share of individuals p with foreign background in the municipality. For the SND data too, it turned out that percentile p is (almost) always either of the two most positive alternatives (alternative 4 or 5).¹⁶ Therefore, we proceed as with the FSI data by transforming this attitude variable into a dummy variable that equals zero if the attitude of the marginal employer is alternative 5 (most positive) and one if the attitude of the marginal employer is alternative 4 (secondly most positive).

¹⁶ In 36 out of 290 municipalities percentile p of the SND attitude distribution was actually answer 3 or 2. But since these cases are relatively few we give them the same code as alternative 4 in the analysis. Hence, we only distinguish between the most positive attitude of the marginal employer (alternative 5) and the remaining attitudes of the marginal employer (which in the data are either alternative 4, 3 or 2).

Panel b of Table 5 reports the results for the instrument variables. It is striking that the point estimates in all specifications are larger when the FSI attitude measure is instrumented. Noteworthy is also that the point estimate of the share of employers with negative attitudes now is highly significant (and negative as before) when included alone in the regression (see Column 1-3). Also, the impact of the attitude of the marginal employer is reinforced in this analysis (see Column 5-8). Most interesting for our research question is that the association between the share of employers with negative attitudes and the ethnic wage gap disappears when we jointly include the share of employer with negative attitudes and the attitude of the marginal employer in the regression (see Column 9-12). This confirms what was find in the main analysis, namely, that it is the attitude of the marginal employer that is important for the ethnic wage gap and not the share of employers with negative attitudes.

In Table A1 and A2 (panel b) in Appendix A the analysis with instrument variables is repeated for low and high skilled occupations, respectively. These results are basically the same as in the main analysis: the association between the attitude of the marginal employer and the ethnic wage gap is especially strong for low skilled occupations.

6. Discussion

This paper has investigated the consequences of negative attitudes towards minorities among employers for the ethnic wage gap in the Swedish labor market. Our starting-point was Becker's model, which implies that it is the attitude of the marginal employer that determines the ethnic wage gap if minority workers sort away from the most prejudiced employers in the labor market.

Motivated by Becker's model we started by examining whether minority workers have an incentive to sort in the labor market in accordance to the model. This was done by conducting a field experiment of discrimination in hiring and relating the results of the experiment to the attitudes of the employers. We found that the probability of being invited to a job interview for applicants with a typical Middle Eastern name is lower in municipalities where the attitudes among the employers also are more negative. The experimental design allows us to interpret this as a causal effect, which was found especially strong for low skilled occupations. From this part of the analysis we conclude that minority groups such individuals with a Middle Eastern background have an incentive to sort away from the most prejudiced employers in the labor market.

The next part of the study examines whether minority workers in reality sort in accordance to the incentive found in the first part of the study and, if so, what the consequences are for the ethnic wage gap.¹⁷ Again motivated by Becker's model, we hypothesized that it is the attitude of the marginal employer in a municipality that is important for the ethnic wage gap, and not the share of employers with negative attitudes. We find strong support for the hypothesis, which suggests that minority workers do sort away from the most prejudiced employers in the labor market. In this case as well, the results are especially strong for low skilled occupations, where the largest raw ethnic wage gap also was found.

Can this result be interpreted as a causal effect such that the attitude of the marginal discriminator generates the ethnic wage gap? The main issue with this interpretation is the existence of municipality characteristics, which are not controlled for, and that are correlated both with the ethnic wage gap and with attitudes. In an attempt to address this

¹⁷ In principle, this part replicates Charles and Guryan (2008) for the Swedish case.

problem we included what we believe are proper control variables at the municipality level and we also instrumented the FSI attitude measure. This did essentially not change the results.

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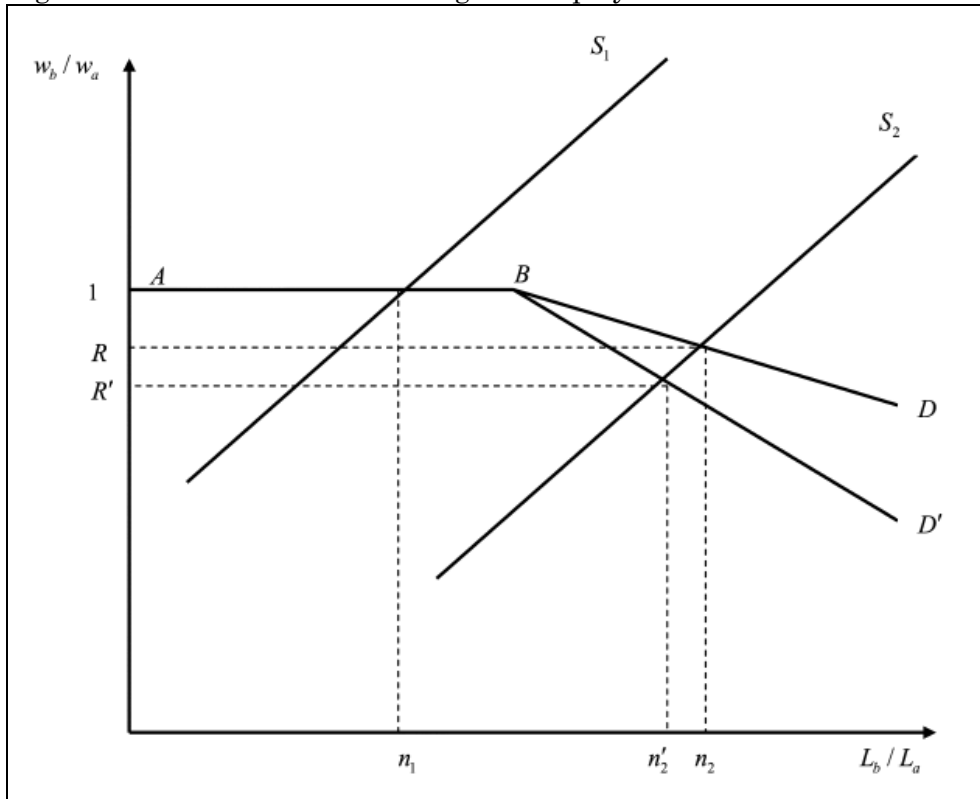
Appendix A

*** Table A1 about here ***

*** Table A2 about here ***

Figures:

Figure 1. The attitude of the marginal employer.



Notes: This figure is taken from Charles & Guryan (2008).

Figure 2. The share responding alternative 4 – Not valuable at all.

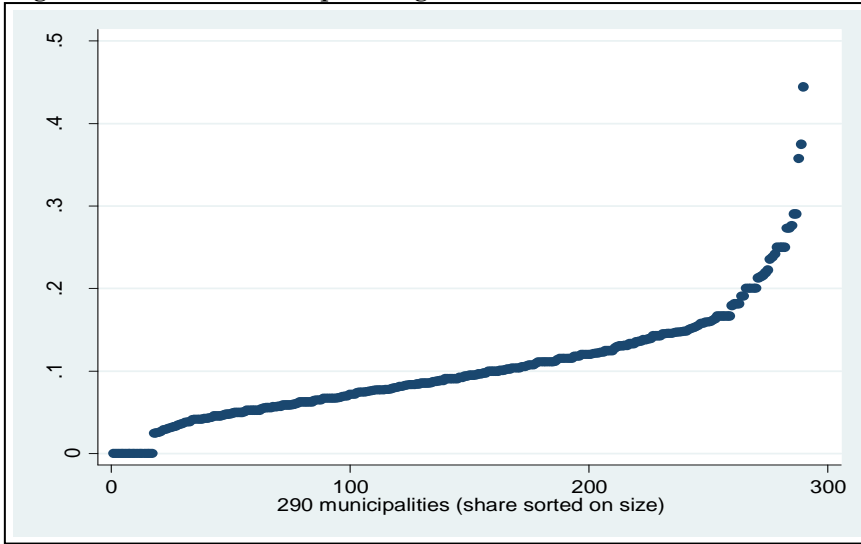
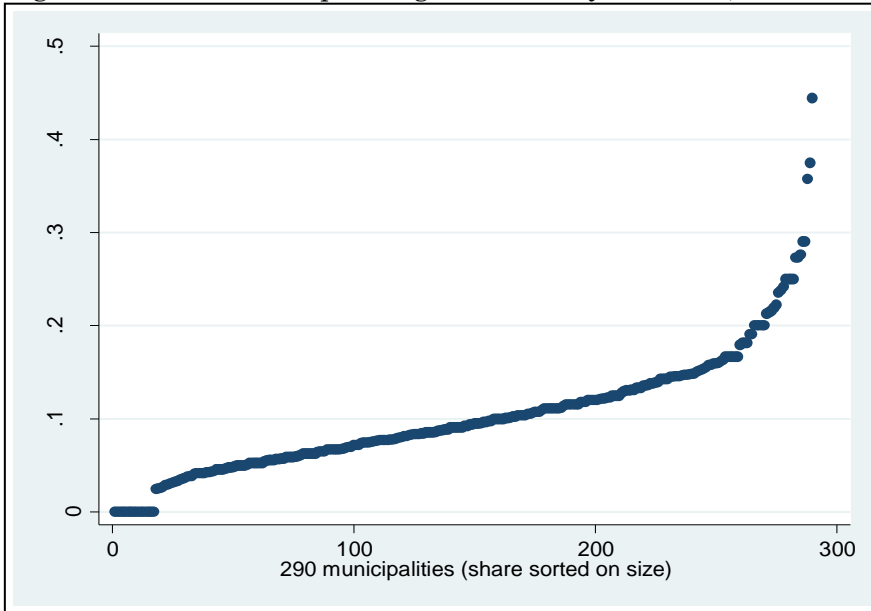


Figure 3. The share responding 3 – Not very valuable, or 4 – Not valuable at all.



Tables:

Table 1. Result for correspondence testing.

	Typical Swedish name No. jobs = 2,837	Typical Middle Eastern name No. jobs = 2,820	Difference
No. invitations to interview	762	491	
Callback rate	26.9	17.4	9.5***

Notes: This table reports the total result of the experiment. The critical χ^2 -value at the one percent level of significance is 6.63 (***). The McNemar statistic for paired proportions is applied.

Table 2. The probability of being invited to an interview

	Negative attitude = answering alternative 3 or 4		Negative attitude = answering alternative 4	
	All occupations	Low skilled occupations	All occupations	Low skilled occupations
Typical Middle Eastern name	-0,03 [0,05]	0,00 [0,05]	-0,09*** [0,03]	-0,07** [0,03]
Share negative attitudes in municipality	-0,11 [0,12]	-0,10 [0,13]	-0,11 [0,25]	0,18 [0,27]
Typical Middle Eastern name *	-0,19 [0,15]	-0,29* [0,17]	-0,02 [0,32]	-0,29 [0,36]
N	5635	3532	5635	3532

Notes: This table reports how attitudes affect the difference in the probability of being offered a job interview by using a continuous variable as attitude measure. *, **, and *** denote the ten, five, and one percent significance level, respectively. Reported standard errors (in brackets) are adjusted for clustering on the job.

Table 3. The probability of being invited to an interview

	Negative attitude = answering alternative 3 or 4		Negative attitude = answering alternative 4	
	All occupations	Low skilled occupations	All occupations	Low skilled occupations
Typical Middle Eastern name	-0,09*** [0,01]	-0,08*** [0,01]	-0,09*** [0,01]	-0,08*** [0,01]
Share negative attitudes in municipality above average	0,00 [0,02]	0,00 [0,02]	-0,01 [0,02]	0,01 [0,02]
Typical Middle Eastern name *	-0,05* [0,03]	-0,07** [0,03]	-0,03 [0,02]	-0,05** [0,02]
Share negative attitudes in municipality above average				
N	5635	3532	5635	3532

Notes: This table reports how attitudes affect the difference in the probability of being offered a job interview, using a dummy variable as attitude measure. *, **, and *** denote the ten, five, and one percent significance level, respectively. Reported standard errors (in brackets) are adjusted for clustering on the job.

Table 4. Log earnings 2003.

	All occupations			High skilled occupations			Low skilled occupations		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Share with negative attitudes	-0.18*** [0.06]	-	-0.22*** [0.06]	-0.28*** [0.08]	-	-0.31*** [0.07]	0.02 [0.06]	-	0.02 [0.07]
Minority * Share with negative attitudes	-0.11 [0.15]	-	-0.08 [0.13]	-0.06 [0.10]	-	-0.04 [0.09]	0.03 [0.16]	-	0.06 [0.14]
Attitude of the marginal employer	-	0.05*** [0.01]	0.06*** [0.01]	-	0.06*** [0.02]	0.07*** [0.02]	-	0.01 [0.01]	0.01 [0.01]
Minority * Attitude of the marginal employer	-	-0.10*** [0.02]	-0.10*** [0.02]	-	-0.04** [0.02]	-0.05*** [0.02]	-	-0.12*** [0.03]	-0.12*** [0.03]
N	509,360	509,360	509,360	218,493	218,493	218,493	290,867	290,867	290,867

Notes: All regressions also include an ethnic dummy variable as well as variables for age, years of schooling, and the principle orientation of the education. *, **, and *** denote the 10, 5 and 1 percent significance level, respectively. Reported standard errors (in parentheses) are robust.

Table 5. Log earnings 2003. All occupations. N = 509,360

Panel a) FSI attitude measure:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Share with negative attitudes	-0,18*** [0,06]	-0,11** [0,04]	-0,06 [0,05]	-0,10** [0,04]	-	-	-	-	-0,22*** [0,06]	-0,14*** [0,05]	-0,09* [0,05]	-0,01 [0,06]
Minority * Share with negative attitudes	-0,12 [0,15]	-0,04 [0,13]	-0,04 [0,13]	-0,04 [0,12]	-	-	-	-	-0,08 [0,13]	-0,01 [0,12]	-0,02 [0,11]	0,13 [0,12]
Attitude of the marginal employer	-	-	-	-	0,05*** [0,01]	0,03*** [0,01]	0,02** [0,01]	0,01 [0,01]	0,06*** [0,01]	0,04*** [0,01]	0,03** [0,01]	-0,01 [0,01]
Minority * Attitude of the marginal employer	-	-	-	-	-0,10*** [0,02]	-0,08*** [0,02]	-0,08*** [0,02]	-0,07*** [0,02]	-0,10*** [0,02]	-0,08*** [0,02]	-0,08*** [0,02]	-0,09*** [0,03]
<i>Control variables (at the municipality level):</i>												
Level of unemployment	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Characteristics of the minority population	No	No	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes
Share minority individuals	No	No	No	Yes	No	No	No	Yes	No	No	No	Yes
Panel b) SND attitude measure as IV	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Share with negative attitudes	-0,37* [0,21]	-0,29* [0,15]	-0,37*** [0,13]	-0,35*** [0,12]	-	-	-	-	-0,85*** [0,33]	-0,71** [0,28]	-1,14 [1,21]	-0,53 [0,52]
Minority * Share with negative attitudes	-1,12*** [0,38]	-0,81** [0,35]	-0,87** [0,35]	-0,76** [0,34]	-	-	-	-	-0,43 [0,38]	-0,28 [0,35]	0,43 [1,34]	-0,25 [0,53]
Attitude of the marginal employer	-	-	-	-	0,13** [0,05]	0,11** [0,05]	0,14 [0,15]	-0,03 [0,13]	0,19** [0,09]	0,16** [0,08]	0,58 [0,75]	0,10 [0,28]
Minority * Attitude of the marginal employer	-	-	-	-	-0,25*** [0,06]	-0,21*** [0,06]	-0,21*** [0,06]	-0,18*** [0,06]	-0,31*** [0,08]	-0,27*** [0,08]	-0,29* [0,17]	-0,20*** [0,08]
<i>Control variables (at the municipality level):</i>												
Share unemployed	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Characteristics of the minority population	No	No	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes
Share minority	No	No	No	Yes	No	No	No	Yes	No	No	No	Yes

Notes: All regressions also include an ethnic dummy variable as well as variables for age, years of schooling, and the principle orientation of the education. Panel a) shows the results for the FSI attitude measure when controlling for various variables at the municipality level. Panel b) shows the results from the corresponding regressions when the FSI attitude measure is instrumented with the SND attitude measure using the IVREG command in Stata. *Characteristics of the minority population* include the share of immigrants from outside the EU, the share of immigrants from outside the EU that are employed, the share on income support among the foreign born, and the share of refugees among the immigrants. *, **, and *** denote the 10, 5 and 1 percent significance level, respectively. Reported standard errors (in parentheses) are robust.

Table A1. Log earnings 2003. Low skilled occupations. N = 290,867

<i>Panel a) FSI attitude measure:</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Share with negative attitudes	0,02 [0,07]	0,05 [0,07]	0,01 [0,05]	-0,02 [0,05]	-	-	-	-	0,01 [0,07]	0,06 [0,07]	0,02 [0,06]	-0,01 [0,06]
Minority * Share with negative attitudes	0,04 [0,16]	0,12 [0,14]	0,11 [0,13]	0,11 [0,13]	-	-	-	-	0,08 [0,15]	0,14 [0,13]	0,13 [0,13]	0,13 [0,12]
Attitude of the marginal employer	-	-	-	-	0,01 [0,01]	0,00 [0,01]	0,00 [0,01]	-0,01 [0,01]	0,01 [0,01]	-0,01 [0,01]	0,00 [0,01]	-0,01 [0,01]
Minority * Attitude of the marginal employer	-	-	-	-	-0,12*** [0,03]	-0,11*** [0,03]	-0,10*** [0,02]	-0,09*** [0,02]	-0,12*** [0,03]	-0,10*** [0,03]	-0,10*** [0,03]	-0,09*** [0,03]
<i>Control variables (at the municipality level):</i>												
Level of unemployment	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Characteristics of the minority population	No	No	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes
Share minority individuals	No	No	No	Yes	No	No	No	Yes	No	No	No	Yes
<i>Panel b) SND attitude measure as IV</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Share with negative attitudes	-0,04 [0,20]	-0,07 [0,16]	-0,10 [0,13]	-0,10 [0,13]	-	-	-	-	-0,24 [0,34]	-0,22 [0,31]	-0,89 [2,03]	-0,01 [0,93]
Minority * Share with negative attitudes	-1,11** [0,52]	-0,84* [0,47]	-0,80* [0,46]	-0,70 [0,44]	-	-	-	-	-0,31 [0,48]	-0,13 [0,45]	0,75 [2,58]	-0,25 [0,91]
Attitude of the marginal employer	-	-	-	-	0,05 [0,05]	0,03 [0,05]	0,10 [0,16]	-0,06 [0,16]	0,07 [0,08]	0,05 [0,08]	0,51 [1,22]	-0,06 [0,47]
Minority * Attitude of the marginal employer	-	-	-	-	-0,30*** [0,08]	-0,27*** [0,08]	-0,26*** [0,08]	-0,23*** [0,07]	-0,32*** [0,09]	-0,29*** [0,10]	-0,35 [0,32]	-0,22* [0,12]
<i>Control variables (at the municipality level):</i>												
Share unemployed	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Characteristics of the minority population	No	No	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes
Share minority	No	No	No	Yes	No	No	No	Yes	No	No	No	Yes

Notes: All regressions also include an ethnic dummy variable as well as variables for age, years of schooling, and the principle orientation of the education. Panel a) shows the results for the FSI attitude measure when controlling for various variables at the municipality level. Panel b) shows the results from the corresponding regressions when the FSI attitude measure is instrumented with the SND attitude measure using the IVREG command in Stata. *Characteristics of the minority population* include the share of immigrants from outside the EU, the share of immigrants from outside the EU that are employed, the share on income support among the foreign born, and the share of refugees among the immigrants. *, **, and *** denote the 10, 5 and 1 percent significance level, respectively. Reported standard errors (in parentheses) are robust.

Table A2. Log earnings 2003. High skilled occupations. N = 218,493

<i>Panel a) FSI attitude measure:</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Share with negative attitudes	-0,29*** [0,08]	-0,18*** [0,06]	-0,06 [0,05]	-0,10** [0,04]	-	-	-	-	-0,31*** [0,07]	-0,20*** [0,05]	-0,10* [0,05]	-0,13*** [0,05]
Minority * Share with negative attitudes	-0,06 [0,10]	-0,01 [0,08]	-0,01 [0,08]	-0,01 [0,07]	-	-	-	-	-0,04 [0,09]	0,01 [0,07]	0,00 [0,07]	0,00 [0,07]
Attitude of the marginal employer	-	-	-	-	0,07*** [0,02]	0,05*** [0,01]	0,03*** [0,01]	0,02** [0,01]	0,07*** [0,02]	0,06*** [0,01]	0,04*** [0,01]	0,03*** [0,01]
Minority * Attitude of the marginal employer	-	-	-	-	-0,04** [0,02]	-0,02 [0,01]	-0,03* [0,01]	-0,02 [0,01]	-0,05*** [0,02]	-0,03* [0,01]	-0,03** [0,01]	-0,02 [0,01]
<i>Control variables (at the municipality level):</i>												
Level of unemployment	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Characteristics of the minority population	No	No	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes
Share minority individuals	No	No	No	Yes	No	No	No	Yes	No	No	No	Yes
<i>Panel b) SND attitude measure as IV</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Share with negative attitudes	-0,54** [0,23]	-0,31* [0,18]	-0,41*** [0,14]	-0,38*** [0,13]	-	-	-	-	-0,92*** [0,24]	-0,70*** [0,20]	-0,82 [0,53]	-0,47* [0,26]
Minority * Share with negative attitudes	-0,43* [0,22]	-0,20 [0,21]	-0,28 [0,21]	-0,20 [0,21]	-	-	-	-	-0,11 [0,24]	-0,01 [0,22]	0,28 [0,47]	-0,04 [0,26]
Attitude of the marginal employer	-	-	-	-	0,14*** [0,05]	0,13*** [0,04]	0,13 [0,11]	-0,01 [0,09]	0,17** [0,07]	0,15*** [0,05]	0,36 [0,31]	0,05 [0,13]
Minority * Attitude of the marginal employer	-	-	-	-	-0,10** [0,05]	-0,07 [0,05]	-0,08 [0,05]	-0,06 [0,05]	-0,14*** [0,05]	-0,11** [0,05]	-0,11* [0,06]	-0,07 [0,05]
<i>Control variables (at the municipality level):</i>												
Share unemployed	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Characteristics of the minority population	No	No	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes
Share minority	No	No	No	Yes	No	No	No	Yes	No	No	No	Yes

Notes: All regressions also include an ethnic dummy variable as well as variables for age, years of schooling, and the principle orientation of the education. Panel a) shows the results for the FSI attitude measure when controlling for various variables at the municipality level. Panel b) shows the results from the corresponding regressions when the FSI attitude measure is instrumented with the SND attitude measure using the IVREG command in Stata. *Characteristics of the minority population* include the share of immigrants from outside the EU, the share of immigrants from outside the EU that are employed, the share on income support among the foreign born, and the share of refugees among the immigrants. *, **, and *** denote the 10, 5 and 1 percent significance level, respectively. Reported standard errors (in parentheses) are robust.