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ABSTRACT

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

Ethnic minorities have lower wages compared to the ethnic majority in most EU-countries. However, to what extent these wage gaps are the result of prejudice toward ethnic minority workers is virtually unknown. This study sets out to examine what role prejudice play in the creation of the ethnic wage gap in one of Europe's most egalitarian countries, Sweden. The analysis takes into account the important distinction between average employer attitudes and the attitude of the marginal employer. Our results confirm that the attitudes of the marginal employer – but not those of the average employer – are important for the ethnic wage gap. This relationship becomes even stronger when potential measurement error and other forms of endogeneity are accounted for by controlling for a rich set of variables and implementing instrumental variable techniques.

JEL Classification: J64, J71

Keywords: attitudes, prejudice, marginal employer, ethnic wage gap

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1. Introduction

The Amsterdam Treaty has prohibited ethnic discrimination in employment and occupational matters in all EU countries. Still, it is well established that in most EU-countries ethnic minorities have lower wages compared to the ethnic majority (e.g., Adsera & Chiswick, 2007, and OECD, 2007).¹ Moreover, prejudice against the ethnic minority in Europe seems to be severe judging from attitudes surveys and correspondence studies (e.g., Riach and Rich, 2002, Carlsson and Rooth, 2007).

However, to what extent these wage gaps are in fact created by prejudice toward ethnic minority workers is uncertain at best. An ethnic difference in unobserved supply side characteristics could be responsible for these wage gaps as well. In Figure 1 the ethnic/immigrant wage gap for fifteen EU-countries together with the share of individuals with negative attitudes toward the ethnic minority among the public is plotted.² If

¹ See Algan et al. (2010) for a comparative analysis of ethnic differences in labor market outcomes in France, Germany and the United Kingdom.

² The ethnic minority/immigrant wage gaps are taken from Table A3 in Adsera and Chiswick (2007), and controls for years of schooling and age. The share with negative attitudes among the public is calculated from the European Social Survey (ESS), which is a social survey designed to, among other things, map attitudes in Europe (see <http://www.europeansocialsurvey.org>). The ESS has been conducted the following years: 2002, 2004, 2006, 2008, and 2010. By merging these five waves we obtained a sample consisting of 122,670 respondents for the fifteen EU countries where wages also are observed. The prejudice measure plotted in Figure 1 was constructed from the following question: “To what extent do you think [country] should allow people from the poorer countries outside Europe to come and live here?” The answering alternatives are 1 “Allow many to come and live here”, 2 “Allow some”, 3 “Allow a few”, and 4 “Allow none”. For each respondent there is also information about in which country he or she lived at the time of

prejudice is important for explaining the variation in the ethnic wage gap within the EU, prejudice and the ethnic wage gap are expected to be negatively correlated at the country level. However, Figure 1 lends little support for a negative correlation between prejudice and ethnic wage gaps.

*** Figure 1 about here ***

Nevertheless, it might be premature to reject employer prejudice as an important factor that determines the ethnic wage gap in Europe. In a recent paper, Charles and Guryan (2008) propose a new methodology for analyzing the effect of employer prejudice on the ethnic wage gap. They emphasize the importance of taking into consideration one of Becker's (1957) insights, namely, the distinction between average employer attitudes and the attitude of the marginal employer; it is the attitude of the marginal 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 be determined by the most prejudiced employer that hires minority workers and not by average employer attitudes, which is what we use in Figure 1.

The main contribution of the current paper is to analyze to what extent negative attitudes toward the ethnic minority are an important factor that determines the ethnic wage gap in an European context when specifically taking the attitude of the *marginal*

the survey. Based on this information the prejudice measure was constructed at the country level by calculating the share that responded either alternative 3 or 4.

employer into account. Unfortunately, the aggregated European data presented in Figure 1 do not have enough variation in the prejudice of the marginal employer to allow for an implementation of the Charles and Guryan design. Instead we follow an alternative route by analyzing the prejudice-ethnic wage gap link for Sweden. In Figure 1 Sweden is located furthest to the left, that is, Sweden is the least prejudiced country among these fifteen EU-countries. Sweden is in this respect a benchmark case – if employer attitudes toward ethnic minorities have consequences for the ethnic wage gap in one of the most egalitarian countries in Europe, prejudice is also expected to matter in less egalitarian countries.

The data available for Sweden not only allow for calculating the ethnic wage gap and the share of employers with negative attitudes at the regional level. They also allow for constructing a measure of the attitude of the marginal employer at the regional level by combining the regional distribution of attitudes with the share of minority workers in a region. Our strategy for testing the prejudice-ethnic wage gap link is to use regional variation in the ethnic wage gap, average attitudes, and the attitude of the marginal employer.

In addition to analyzing the role of marginal prejudice for the ethnic wage gap in a European context we extend Charles and Guryan's (2008) analysis in two ways. Firstly, we address whether it makes a difference to the results if we take the employment of ethnic minority workers by ethnic minority employers into account. Secondly, we make an attempt to correct for any endogeneity of the prejudice measure by proposing two different instrumental variable strategies. Another strength of the current study is the

relatively large number of units (290) at the level where the ethnic wage gap and the attitudes are measured.

The results confirm that the attitudes of the marginal employer – but not those of the average employer – are important for the ethnic wage gap. This distinction is precisely what to expect if minority workers sort away from the most prejudiced employers in the labor market. This result becomes even stronger when we take into account potential measurement error and other forms of endogeneity using a rich set of control variables as well as instrumental variable techniques. In summary, our findings indicate that employer prejudice is important for the ethnic wage gap even in an egalitarian country such as Sweden.

The remaining of this paper is organized as follows. Section 2 presents the Becker model and reviews some previous studies in this area, while Section 3 presents the data on attitudes and wages and how we construct the prejudice measures. Section 4 examines the association between prejudice and the ethnic wage gap, while Section 5 runs a number of sensitivity analyses of this relationship. Section 6 discusses the results.

2. Previous studies

Charles and Guryan (2008) 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 average attitude of the 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 2). 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 2 about here ***

Now, instead imagine a situation where there is a relative large supply of Black workers (S_2 in Figure 2). In this case there will not be enough non-prejudiced employers to hire all Black workers – the marginal employer is prejudiced. Thus, for the market to clear in this case the wages for Black workers have to be lower than for White workers. These two situations illustrate that when Black workers sort to the least prejudiced employers it is the prejudice/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 prejudice among employers affect the relative wage for Black workers. Suppose that a shift of the relative demand curve occurs from D to D' such that prejudice 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 prejudice of the average employer if the attitude of the marginal employer remains the same.

Charles and 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 attitude of the marginal employer significantly and negatively influences the 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 studies if the share of employers with negative attitudes affects the refugee immigrant earnings gap in Sweden. They attempt to control for unobserved regional ethnic skill differences by utilizing a Swedish refugee settlement policy, which basically implies random placement of refugees in regions. They find that having relatively more negative attitudes in a region increases the ethnic wage differential and also influences future mobility decisions of refugee immigrants away from more prejudiced regions.

Åslund & Rooth (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 shock to 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.

Rooth (2010) also studies 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 toward people from the Middle East – 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.

Finally, Pager and Quillian (2005) examine the relationship between employers' attitudes towards hiring Black and White ex-offenders and their actual hiring behavior. They find a large race difference in the likelihood of being hired, but there was no indication of a corresponding difference in employers' reported attitudes towards Black and White ex-offenders.

3. Data

The aim of this section is to present the construction of the different prejudice measures that will be used in the empirical analysis: the share with negative attitudes towards the ethnic minority, marginal prejudice and extreme prejudice. We also explain how the ethnic earnings gap is calculated and what data are used to this end.

3.1 The prejudice measures

To construct the measures of employer prejudice we use data obtained from FSI (2004), a Swedish research institute that, among other things, measures attitudes of the Swedish population on various dimensions. Of course it would have been an advantage if we had survey data specifically aimed at measuring employer attitudes and not only the attitudes of the general public. Since such data are not available we make the assumption that it is

the same mechanisms that determine employer attitudes and the attitudes of the general public in a region.³

The FSI attitude survey has been conducted each year since the 1980s on a random sample of individuals in the Swedish population. By merging the years 2000 to 2008, a sample consisting of 19,555 respondents was obtained. The prejudice measures were then 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” (14 %), 2) “Quite valuable” (44 %), 3) “Not very valuable” (31 %), and 4) “Not valuable at all” (11 %).⁴ For each respondent there is also information about in which municipality he or she lived at the time of the survey. Based on this information the prejudice measures were constructed at the municipality level.

³ In Carlsson and Rooth (2011) we relate the share with negative attitudes towards the ethnic minority to the ethnic difference in callback rates for a job interview within a field experiment. When dividing the municipalities into "good" and "bad" ones depending on if the share having negative attitudes in a region was below or above the sample average we find that the ethnic gap in callbacks for a job interview is greater in "bad" compared to "good" regions. In other words, whether a municipality is classified as “bad” or “good” can to some extent predict the ethnic difference in callbacks for a job interview. This suggests that there in fact is a link between public prejudice, employer prejudice and discriminatory behavior when hiring.

⁴ The question also includes an additional alternative, “Unsure, do not know”, which was excluded in the construction of the prejudice measure, since this alternative is difficult to interpret. 3,011 respondents out of 19,555 answered this alternative. The survey also contained other questions about immigrants and immigration to Sweden. However, these questions were more about immigration legislation, while the chosen question is more related to the immigrant group itself.

The first measure is defined as the share in a municipality that has negative attitudes towards the ethnic minority, that is, responded either 3 – “Not very valuable” – or 4 – “Not valuable at all”. Figure 3 shows the distribution of this measure for the 290 municipalities in Sweden. Judging from the figure, this attitude measure is distributed across the prejudice scale, from very low degrees of prejudice to very high. Moreover, Figure 4 shows that very prejudiced regions are not particularly geographically concentrated, but rather distributed throughout the country.

*** Figure 3 and 4 about here ***

The second measure – the prejudice of the *marginal* employer in a municipality – is constructed by combining the distribution of answers to the attitude question with the share p of the workforce with an ethnic minority background.⁵ More specifically, the prejudice of the marginal employer is defined as percentile p in the answer distribution of the FSI attitude question, where the possible answers go from 1 to 4. It turns out that in all instances the percentile p corresponds either to answer 1 or 2, thus indicating that the marginal employer is not very prejudiced. This is precisely what the Becker model would predict if the supply of ethnic minority labor is relatively low – as in our case – and

⁵ The share of the workforce in a region that belongs to the ethnic minority is calculated using the male population being 25-40 years old, which is expected to have a strong attachment to the labor force. To the extent that the ethnic minority has a weaker labor force participation rate than the majority this approximation will introduce measurement error in the variable that measures the prejudice of marginal employer. Measurement error will in this case lead to a downward bias and we underestimate the relationship between the ethnic wage gap and the prejudice of the marginal employer.

ethnic minority workers are able to sort themselves to the least prejudiced employers. Since the attitude of the marginal employer only takes two values, 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, that is, in the latter case, the marginal employer is more prejudiced.

One could suspect that these prejudice measures – the share with negative attitudes and marginal prejudice – are strongly correlated, but in fact, it turns out that their correlation is quite low ($r=0.23$). This can also be seen in Figure 4 in that there are clear differences in the geographical distribution of the share with negative attitudes and marginal prejudice. Such distributional differences exist also within LMAs; see for example the three large LMAs of Stockholm, Gothenburg and Malmoe in Figure 4 (regions within the circles). One could also be worried that marginal prejudice is strongly correlated with the ethnic minority share in a municipality. However, also that correlation is quite low ($r=0.39$) despite the fact that marginal prejudice partly is composed of the ethnic minority share in the region. In an attempt to purge the marginal prejudice measure of the ethnic minority share, we always control for the ethnic minority share in the empirical analysis.

Our final measure of prejudice relates to extreme (negative) attitudes. Such attitudes are not expected to matter if the Becker prejudice model describes the world well, since sorting of minority workers to the least prejudiced employers makes it unlikely that minority workers ever will encounter employers with extreme attitudes. The extreme

attitude in a municipality is defined by the answer to the attitude question (1-4) at the 90th percentile of the prejudice distribution.⁶

3.2 Annual income from work and the ethnic wage gap

The income data consist of annual income from work for the Swedish population in 2003, taken from the tax 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 individuals in this age range are likely to have stable income from work. The analysis is further restricted to study only individuals that belong to the ethnic majority, i.e., native Swedes, or to those who have a non-Nordic foreign background, which constitute the group that we define as the ethnic minority. Some additional restrictions are put on who belongs to the ethnic minority by only including persons who either immigrated to Sweden from a non-Nordic country more than fifteen years ago (13,000 individuals) or were born in Sweden but has at least one parent born outside Scandinavia (24,000 individuals). The use of these restrictions is an attempt to not confuse ethnic wage gaps with immigrant wage gaps, with the latter being more difficult to interpret and explain.

A potential issue is that our "wage" measure is based on annual income instead of hourly wages. However, it can be argued that the variation in annual income from work above a certain threshold closely mimics the variation in hourly wages. The argument is based on the fact that individuals with higher annual income are more likely to have

⁶ In principle, the answer at the 90th percentile could be any alternative, including the most positive alternatives, which would be the case in a municipality where almost all residents are positive to immigrants. However, in our sample, the answer at the 90th percentile is always either alternative 3 or 4. This motivates labeling the answer at the 90th percentile as an *extreme* attitude.

similar amounts of time worked (hours and weeks). For example, Antelius and Björklund (2000) show, in a Swedish context, that if a threshold of 100,000 SEK (approximately 10,000 euro) is used when analyzing annual income from work based on tax records, one receives a return to education similar to the one obtained from analyzing hourly wages. Also in our case we expect an estimate of the ethnic income gap that is based on annual income from work above a 100,000 SEK threshold to be close to an estimate of the ethnic wage gap based on hourly wages. Hence, this motivates only including individuals using annual income from work above 100,000 SEK in the main analysis.⁷

Before turning to the empirical analysis we note that the ethnic income gap in our subsample is approximately -5 percent when we control only for municipality fixed effects.⁸ Figure 4 shows that the size of this wage gap varies to a large extent across the municipalities and there is a quite large variation also within larger labor market areas such as Stockholm, Gothenburg and Malmoe. Finally, Table A1 in the appendix gives the descriptive statistics for all variables used in the empirical analysis.

4. Empirical analysis

In this section the different prejudice measures will be related to the ethnic wage gap at the municipality level. In all regressions log annual income from work (above 100,000

⁷ In Section 5 we also estimate the main models without this threshold, that is, using all individuals with a positive income. Including also individuals with an annual income below 100,000 SEK, did, if anything, strengthen our main findings.

⁸ The average ethnic wage gap is -0.04 and its standard deviation 0.25 when assigning equal weight to each municipality.

SEK) will be the dependent variable, while the explanatory variables of most interest are the various prejudice measures along with their interaction with the ethnic minority indicator. To start with, the ethnic wage gap will be related to the share of employers with negative attitudes in a municipality. However, as explained earlier and motivated by Becker's theory, if minority workers sort away from the most prejudiced employers a more relevant prejudice measure for the relative wage of minority workers should be the prejudice of the marginal employer. Finally, we also test whether extreme attitudes are related to the ethnic wage gap.

In this first set of results we control for a number of important characteristics that are expected to be correlated with the ethnic wage gap and the prejudice variables: the share of the ethnic minority in a region, years of schooling, age and age squared. The share of minority workers is mainly included as a control variable in an attempt to address the fact that the attitude of the marginal employer might – by construction of the variable – capture something related to this variable. For example, if ethnic minority workers with the best unobserved skills selectively sort out from municipalities with a larger share of the minority, we will find a positive correlation between the ethnic wage gap and the share of the ethnic minority. But at the same time prejudice might also be more severe in municipalities with a larger share of the ethnic minority. Without a control for the share of the minority the marginal prejudice variable might capture such a spurious correlation, which would result in an inconsistent estimate (with an upward bias in this example).

Adding the "Mincer" human capital components to the model is an attempt to address other similar endogeneity problems.⁹

In the first column of Table 1, which shows the output from regressing annual income from work on the ethnic minority indicator variable (Minority) and municipality fixed effects, the ethnic wage gap is found to be approximately five percent. When controls for the share of the ethnic minority in the region, years of schooling, age and age squared are added to the model the ethnic wage gap decreases slightly to four percent (see column 2). This is the ethnic wage gap to be explained by our prejudice variables.

*** Table 1 about here ***

In the third column the share of employers with negative attitudes and its interaction with the ethnic minority indicator are added to the model in column 2. The point estimate of the share with negative attitudes shows that workers in regions in which a larger share of the employers are prejudiced receive lower wages, but this correlation is not stronger for the ethnic minority; the interaction effect of the ethnic minority and the share of employers is not statistically significant.

In the fourth column the prejudice of the marginal employer and its interaction term with the ethnic minority indicator is added to the model in column 2. As predicted by the Becker model, the wages of native Swedes are not affected by the prejudice of the marginal employer, but the wages of the ethnic minority are. The interpretation of the

⁹ Our estimates for marginal prejudice are unaffected when age and years of schooling are treated as fixed effects.

point estimate is that ethnic minority workers have on average five percent lower wages compared to majority workers in municipalities where the marginal employer answered "Quite valuable" as opposed to "Very valuable". This association is also estimated with great precision.

As for the other prejudice measures the extreme prejudice measure and its interaction with the ethnic minority indicator are also added to the model in column 2, see column 5. These results are similar to those pertaining to the share with negative attitudes. Extreme prejudice is important in that native Swedes living in regions with relatively more extreme attitudes have lower wages, but there is no additional wage penalty for the ethnic minority. Finally, in column 6 we add all three prejudice measures and their interaction with the ethnic minority indicator to the model in column 2. The results are virtually unchanged if these variables are entered one by one and the only prejudice measure that is associated with the ethnic wage gap is the prejudice of the marginal employer.

In an attempt to mimic the ethnic wage gap – despite using annual earnings – we include only individuals earning more than 100,000 SEK. As an alternative we replicate the regressions in Table 1 but this time we include everyone earning a positive amount. Also for this data only the prejudice of the marginal employer is significantly related to the ethnic wage gap, see Table A3 in the appendix. Since the estimate of marginal prejudice in this specification is more than twice as high compared to in Table 1 it indicates that prejudice also is important for part-time employees.¹⁰

The findings presented in this section mirror those from the Charles and Guryan (2008) study by showing that it is the attitudes of the marginal employer that have the

¹⁰ See Nordin and Rooth (2011) for the ethnic earnings gap when using different cut offs for earnings.

greatest explanatory power for the ethnic wage gap. This is what the Becker prejudice model would predict. In what follows we will address to what extent this is just a spurious finding.

5. Sensitivity analysis - is *marginal prejudice* just a spurious finding?

Next we focus more closely on the results for marginal prejudice and attempt to address several possible alternative explanations for the result, i.e., that the marginal prejudice variable is endogenous. In our context endogeneity can arise from a number of sources such as omitted variables – at either the municipality or worker level, from selective sorting of workers across municipalities, and measurement error in the marginal prejudice variable.¹¹ In an attempt to address some of these issues we first use a control variable strategy. Next we implement a correction procedure of the marginal prejudice measure followed by an instrumental variable strategy. In what follows we also include the share of employers with negative attitudes.¹²

5.1 Control variable strategy

This section attempts to address the endogeneity problems in terms of omitted variables at the municipality and worker level by investigating the sensitivity of our findings for the prejudice variables in Table 1 when adding more and more variables that potentially

¹¹ Endogeneity due to measurement error in the prejudice measure would lead to an underestimation of the effect that prejudice has on the ethnic wage gap, while the direction of the bias for remaining sources of endogeneity is less clear.

¹² The results for marginal prejudice are insensitive to whether this variable is included, and also to whether we include extreme attitudes or not.

are important for misinterpreting the link between marginal prejudice and the ethnic wage gap. A preview of the results presented in Table 2 shows that the only prejudice variable affecting the ethnic wage gap is the prejudice of the marginal employer and, hence, we discuss only the interaction effect with this variable and the ethnic minority dummy in what follows. In contrast to this finding, the share of employers with negative attitudes does not appear to be important for the ethnic wage gap for which it is always statistically insignificant. However, this variable is almost always correlated with majority wages for which it is statistically significant and negative.

In order to address the sensitivity of the estimate of marginal prejudice for the ethnic wage gap when different types of controls are added we start with a somewhat simpler model than what ended Table 1. In the first column of Table 2 only age and age squared are controlled for. When controlling for these variables, the estimate of the marginal prejudice times the ethnic minority indicator interaction becomes even larger, it increases from minus four to minus seven percent, indicating that the estimate in column 6 in Table 1 is affected by omitted variables. Somewhat surprisingly the estimate increases to -0.08 when the share of the ethnic minority in a region is controlled for, see column 2. In the next column years of schooling is added and the estimate of marginal prejudice then drops to -0.05, indicating that the measure of the marginal prejudice partly captures ethnic skill gaps. To further investigate this issue we use information about ethnic cognitive skill gaps measured on a municipality level.¹³ However, the fourth column

¹³ This measure is calculated from the test score on a cognitive test when enlisting for the military, which is mandatory for all Swedish citizens the year they turn 18. It gives the ethnic cognitive skill gap per municipality using the same definition of the ethnic minority as in this paper.

shows that adding this measure of ethnic cognitive skill gaps, if anything, increases the marginal prejudice estimate.

*** Table 2 about here ***

A related issue is whether our measure of marginal prejudice is correlated with local labor market characteristics such as the local unemployment rate. This is perhaps the most obvious variable that might lead to inconsistent estimates if omitted. It does not seem completely unrealistic to assume that prejudice towards the ethnic minority to some extent is driven by the regional level of unemployment. The existence of such a link is problematic for the analysis if the level of unemployment also determines the ethnic wage gap, which 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. The estimate of marginal prejudice is minus six percent when controlling for the share of unemployed in the municipality in the regressions, see column 5.

In column 6 a number of controls measuring the characteristics of the immigrant population at the municipality level are added: the share of immigrants from outside the EU, the share of refugees among the immigrants, and the share on income support among the foreign born (labeled *Characteristics of the minority population* in the tables). The goal here is to control for average ethnic differences in unobserved skills that might be correlated with the attitude measure at the municipality level. Such average ethnic differences may arise if minority workers sort across municipalities. These control

variables are added to the specification in column 5 without affecting the estimate of marginal prejudice, or its precision, at all.

In column 7 we simultaneously add all the characteristics mentioned above. Despite these extensive controls the impact of the prejudice of the marginal employer on the ethnic wage gap is economically and statistically significant (-0.03).

As in the previous section we re-estimate the models in Table 2 including all individuals earning a positive income. The estimate for marginal prejudice in Table A3 is reduced in a similar way as in Table 2 when the different control variables are added, but its magnitude is much larger than in Table 2.

A remaining issue is related to the fact that the marginal prejudice variable is partly constructed from the variable measuring the share of ethnic minority individuals in a municipality. One might be concerned that marginal prejudice captures something related to the share of ethnic minority individuals in the municipality in a non-linear way. In an attempt to address this potential issue we have estimated the main regressions including different degrees of polynomials of the share of minority workers without any change in results.

In conclusion, when re-estimating the model with a number of important control variables added in a stepwise fashion, as well as simultaneously, the coefficient of the prejudice of the marginal employer remains negative and strongly significant.

5.2 Ethnic minority employers

The way we construct the marginal prejudice variable, that is, it being based on population attitudes as opposed to only native Swedes' attitudes, implies that we

implicitly assume that the ethnic minority acts as employers to the same extent as their population share. If ethnic minority employers have the most positive attitudes these individuals will be located to the leftmost in the prejudice distribution and ethnic minority workers would first sort to ethnic minority employers, and to non-prejudiced majority employers, before sorting into evermore prejudiced majority employers.

However, if the ethnic minority does not act as employers to the same extent as their population share we will in this case have measurement error in the marginal prejudice variable. An extreme alternative would instead be to assume that no employers belong to the ethnic minority, that is, a more accurate measure of marginal prejudice would be obtained by removing the leftmost part of the prejudice distribution based on the full population.¹⁴ Since we do not have access to information on the share of ethnic minority employers in a region we just simply exclude p percent of the leftmost side of the population attitude distribution and thereafter construct the marginal prejudice measure in the same way as before. Column 8 in Table 2 shows that the estimate of marginal prejudice basically is unaffected by this procedure.¹⁵

5.3 Instrumenting the marginal prejudice measure

Although we have added control variables in an attempt to solve the potential problems with omitted variables at the municipality and worker level, it is still possible that we have overlooked important control variables. Moreover, so far we have not addressed the issue of measurement error in the attitude variables. The number of respondents to the

¹⁴ We owe to Kate Antonovics for pointing this out.

¹⁵ The correlation between the two marginal prejudice measures is 0.53.

attitude survey that constitute the base for calculating the prejudice measures is very low in some municipalities, hence, potentially giving rise to measurement error. In this section we implement instrumental variable techniques to further address the problem with omitted variables and also measurement error.

From municipality to LMAs – nonrandom sorting across geographic units

The potential problem with omitted variables at the worker level is likely to be related to nonrandom sorting of minority workers across municipality borders that affects the regional unobserved ethnic skill gap.¹⁶ Perhaps the most obvious variable that minority workers might respond to by sorting is employer prejudice itself.

Variation in marginal prejudice comes from two sources: regional differences in the share of the ethnic minority and in the prejudice distribution. The share of the ethnic minority in a municipality is directly controlled for in the main regressions, but the marginal prejudice variable can still be endogenous if the prejudice distribution is. The main concern is that minority workers sort across municipality borders in response to the level of prejudice in such a way that the regional unobserved ethnic skill gap is affected. For example, minority workers with worse unobserved skills might be relatively more responsive to regional prejudice differences and will therefore have a higher probability to relocate to less prejudiced regions. In that case marginal prejudice might only impact the regional ethnic wage gap indirectly through its effect on the unobserved ethnic skill

¹⁶ The prejudice measures can certainly be endogenous due to omitted variables at the municipality level as well. Beyond the control variables that are included in the analysis at the municipality level, we cannot come up with any instruments that would generate exogenous variation in the prejudice measures.

gap and, hence, we are likely to obtain inconsistent estimates (with a downward bias) of how marginal prejudice affects the ethnic wage gap. In a similar way sorting across municipality borders might result in inconsistent estimates of how the share of prejudiced employers in a municipality affects the ethnic wage gap.

In an attempt to address issues related to sorting across municipality borders, we take advantage of the fact that the choice of which region to work in is likely to be limited by factors such as an individual's wish to remain nearby family and friends. This implies that the unobserved ethnic skill gap in sufficiently large geographical regions should be unaffected by sorting across smaller areas. Thus, in the analysis we utilize that an analysis based on a larger area is likely to be more robust to sorting by implementing an instrumental variable technique, where attitudes measured at the smaller municipality level is instrumented by attitudes measured at the larger labor market area level.¹⁷ This strategy will result in consistent estimates of the different prejudice measures if the chosen work location always is inside the larger labor market area.

Column 1 in Table 3 basically replicates column 7 from Table 2, but does not include the share with negative attitudes – the focus is here exclusively on the marginal prejudice measure. In the next column we include the reduced form, i.e., using a marginal prejudice measure based on larger geographical units (labor market areas). Irrespective of being measured on a municipality or LMA level the estimates for marginal prejudiced are very

¹⁷ The idea to use averages for larger spatial areas as instruments for smaller areas is not a new one. For example, Dustmann and Preston (2001) use a similar implementation in a partly methodological paper that studies how negative attitudes toward the ethnic minority are affected by the ethnic composition in the region.

similar.¹⁸ In the third column we instrument marginal prejudice defined on the municipality level with marginal prejudice defined on the LMA level. The estimate increases quite substantially to -0.07, suggesting that there is sorting of workers across municipalities, which leads to a quite substantial downward bias when not taking endogenous sorting into account.¹⁹ In the fourth to sixth column the analysis for the first three columns is repeated but now including, and instrumenting, also the share with negative attitudes. The estimates for the interaction effect of the share with negative attitudes remains statistically imprecise and basically zero in the final IV specification, see column 6. Also, the results for marginal prejudice are virtually unchanged when the share with negative attitudes is included in the regressions.

In conclusion, this exercise suggests that marginal prejudice is even more important for the ethnic wage gap than what was found in the main analysis.

Attitudes reflected in general elections – correcting for measurement error

Due to very few respondents in some municipalities, the constructed attitude measures are likely to be plagued by measurement error, which would lead to inconsistent and downwards biased estimates of how attitudes affect the ethnic wage gap. In this section we try to correct for measurement error in the attitude variables by using instrumental variable techniques. The idea is to find an alternative attitude measure that can be used as

¹⁸ The sample correlation between marginal attitudes at the municipality and labor market area level is approximately 0.51. Also, this similarity in estimates when using larger geographic areas indicates that measurement error is less of an issue. However, below, when using another measure of prejudice and an instrumental variable strategy, we find measurement error to create an important downward bias.

¹⁹ The t-value of the first stage regression is around 219.

an instrument for the FSI attitude measure. In effect, such an instrumental variable strategy will use only the variation in the FSI attitude measure that is also present in the alternative attitude measure. To the extent that the measurement errors in the two attitude measures are uncorrelated, this approach will purge the estimates from the downward bias caused by measurement error.

Our alternative attitude measure is the number of votes casted – at the municipality level – on the populist anti-immigration party The Sweden Democrats (SD) in the 2010 general election in Sweden. When assigning equal weights to the 290 municipalities we find that SD received on average around 6.3 percent of the total number of votes with a standard deviation of approximately 2.5.²⁰ As an instrument for the regional share of employers with negative attitudes we simply use the share of the population that voted for SD in each municipality.

How to construct the instrument for marginal prejudice might, however, be less obvious. If we consider the share v that voted for SD in a particular municipality, this number represents a rough distribution of all the votes in a municipality with only two mass points: $(1-v)$ is the percentage that did not vote for SD and v is the percentage that did vote for SD. To the extent that voting for SD reflects attitudes, $(1-v)$ defines the share with positive attitudes and v the share with negative attitudes in a municipality. Accepting this as a prejudice distribution should make it possible to calculate regional marginal prejudice the same way as before by pinpointing the attitude at percentile p in this simple prejudice distribution (where p as before is the share of the minority in a municipality).

²⁰ When the results at the municipality level is weighted by the number of votes in each municipality the average is instead roughly around 5.7 percent, which is the official election result in 2010.

However, it turns out that when marginal prejudice is defined in this way it always takes the most positive alternative.²¹ Hence, the problem with this approach appears to be that the share that voted for SD is a very rough measure of attitudes.

An alternative way to extract at least part of the information common to both prejudice measures is to standardize the share that voted for SD as well as the share of the minority and then simply compare the two standardized variables for each municipality. We construct this alternative marginal prejudice indicator by assigning a zero to the indicator when the standardized share of the minority is less than the standardized share that did not vote for SD (153 municipalities) and setting it to one otherwise (137 municipalities). With this construction marginal prejudice should on average be lower in municipalities where the indicator equals zero as opposed to one. Although being a rough measure of marginal prejudice it is a valid instrument for the FSI marginal prejudice measure if the two measures have measurement errors that are uncorrelated, which we find quite likely since the attitude measures is constructed from primary data that were collected independently using very different methods.

The first column of Table 4 replicates the first column of Table 3, producing an estimate of -0.03 for marginal prejudice. In the next column we include the reduced form, i.e. using the alternative marginal prejudice measure based on the share that voted for SD. Even if the two marginal prejudice measures only have a correlation of $r=0.09$ their estimates are identical. In the third column we instrument marginal prejudice defined by

²¹ The obvious explanation is that the clear majority of citizens did not vote for SD and the share of the minority is relatively low in all municipalities; the share $(1-v)$ that did not vote for SD is always above 86 percent and at the same time the share of the minority is always below 46 percent.

FSI by marginal prejudice defined by SD and find that the estimate increases quite substantially to -0.15.²² Hence, this result suggests that measurement error in the marginal prejudice measure leads to substantial downward bias.

In the fourth to sixth column this exercise is repeated but with the change that also the share with negative attitudes is included and instrumented. The reason why we do not find a correlation between the ethnic wage gap and the share with negative attitudes in the main analysis could be because the share with negative attitudes is measured with error. However, that does not appear to be the case since column six, if anything, indicates that both the direct effect and the interaction now are statistically imprecise and the interaction effect is close to zero.²³

In this section we have shown that adding a number of specific control variables indicates the existence of a small but important positive bias for our marginal prejudice estimate, while both endogenous geographic sorting and measurement error indicate the existence of a much more severe downward bias in the same estimate. Throughout this analysis the estimate for the share of employers with negative attitudes remains statistically unimportant for the ethnic wage gap. This sensitivity analysis then confirms and strengthens what was found 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.

²² The t-value of the first stage regression is 55.

²³ This result is not due to the instrument being weak since the t-value in the first stage regression is 4, see Table 4.

Of interest is also to what extent prejudice of the marginal employer successfully explains the wage difference between native Swedes and the ethnic minority. In many of the models in Table 2 to 4 the point estimate of the ethnic minority indicator actually becomes zero, indicating that prejudice of the marginal employer is important enough to explain the whole ethnic wage gap. However, interpreting the impact of prejudice in such a way is premature since the precision of the point estimate is too weak, with its confidence interval often incorporating negative values as well. Hence, we are reluctant to draw any firm conclusions as to whether marginal prejudice explains the whole ethnic wage gap or only a portion of it.

6. Discussion

Our starting point in this paper was the observation that there is substantial variation in ethnic wage gaps across Europe and also in population attitudes toward ethnic minorities. If population attitudes also reflect employer attitudes a relevant hypothesis is that the variation in attitudes, at least to some extent, explains the variation in the ethnic wage gap. However, a simple plot of the ethnic wage gap against the population share of negative attitudes toward ethnic minorities for 15 European countries does not disclose any clear relationship between the two variables. But with Becker's prejudice model in mind this is perhaps not so surprising since it is not the share of employers with negative attitudes that should be important for the ethnic wage gap, but rather the prejudice of the marginal employer.

Despite this clear predication from Becker's model we are only aware of one empirical paper – Charles and Guryan's study of the US labor market – that examines the

link between the prejudice of the marginal employer and the ethnic wage gap. In contrast to Charles and Guryan, the current study takes a European perspective by examining the prejudice-ethnic wage gap link for Sweden, which is often viewed as one of the most egalitarian countries among the EU states.

Our main analysis supports the hypothesis that it is marginal prejudice and not the share of employers with negative attitudes that is important for the ethnic wage gap. But do the results have a causal interpretation? The major issue is the potential existence of omitted variables either at the municipality or worker level, which are correlated both with the ethnic wage gap and with negative attitudes. In an attempt to address problems of this kind we included what we believe are proper control variables at the municipality level and worker level and also instrumented the prejudice measures. Instrumental variables techniques were also implemented in order to deal with potential measurement error in the prejudice measures. These exercises did, if anything, strengthen our previous findings in that there exist enough prejudiced employers in relation to the supply of ethnic minority workers to arrive at a significant ethnic wage gap.

In summary, the results presented in this paper strongly support the hypothesis that prejudice on the behalf of the marginal employer is indeed important in creating an ethnic wage gap in Sweden. Rooth (2010) also provides evidence that employer attitudes matter in the labor market; he shows that employers with more negative attitudes toward the minority indeed act on such prejudice in a hiring situation. Given the similarity in the economic situation for the ethnic minority in Sweden and in other EU states, and that Sweden usually is presented as one of the most egalitarian countries within EU, it is likely that what we present here also holds in other EU countries. Therefore, EU

authorities may have to further strengthen discrimination legislation and its preventive work with respect to prejudice against ethnic minorities.

References

Adsera, A. and Chiswick, B (2007) "Are there gender and country of origin differences in immigrant labor market outcomes across European destinations?," *Journal of Population Economics*, 20(3):495-526.

Algan, Y., Dustmann, C., Glitz, A. and Manning, A. (2010) "The Economic Situation of First- and Second-generation Immigrants in France, Germany and the United Kingdom", *Economic Journal*, 120(542):F4-F30.

Antelius, J. and Björklund, A. (2000) "How Reliable are Register Data for Studies of the Return on Schooling? An examination of Swedish data", *Scandinavian Journal of Educational Research*, 44(4):341-355.

Aslund, O. and Rooth, D-O. (2005) "Shifts in attitudes and labor market discrimination: Swedish experiences after 9-11," *Journal of Population Economics*, 18(4):603-629.

Becker G. S. (1957) *The Economics of Discrimination*, Chicago: University of Chicago Press.

Carlsson M. and Rooth D-O. (2007) 'Evidence of Ethnic Discrimination in the Swedish Labor Market Using Experimental Data', *Labour Economics*, 14(4):716-729

Carlsson M. and Rooth D-O. (2011) 'Revealing Taste-Based Discrimination in Hiring: A Correspondence Testing Experiment with Geographic Variation', IZA Discussion Paper #6153.

Charles, K. and Guryan, J. (2008) "Prejudice and Wages: An Empirical Assessment of Becker's The Economics of Discrimination," *Journal of Political Economy*, 116(5):773-809.

Dustmann, C. and Preston, I. (2001) "Attitudes to Ethnic Minorities, Ethnic Context and Location Decisions", *Economic Journal*, 111(470):353-73.

FSI (2004), Några frågor om invandringen och invandrare/flyktingar, Forskningsgruppen för Samhälls- och Informationsstudier, Stockholm.

Nordin, M. and Rooth, D. (2010) "The Ethnic Employment and Income Gap in Sweden: Is Skill or Labor Market Discrimination the Explanation?", *Scandinavian Journal of Economics*, 111:487-510.

OECD (2007) *International Migration Outlook*. OECD, Paris.

Pager D. and Quillian L. (2005), 'Walking the Talk? What Employers Say Verses What They Do', *American Sociological Review*, 70:355-380.

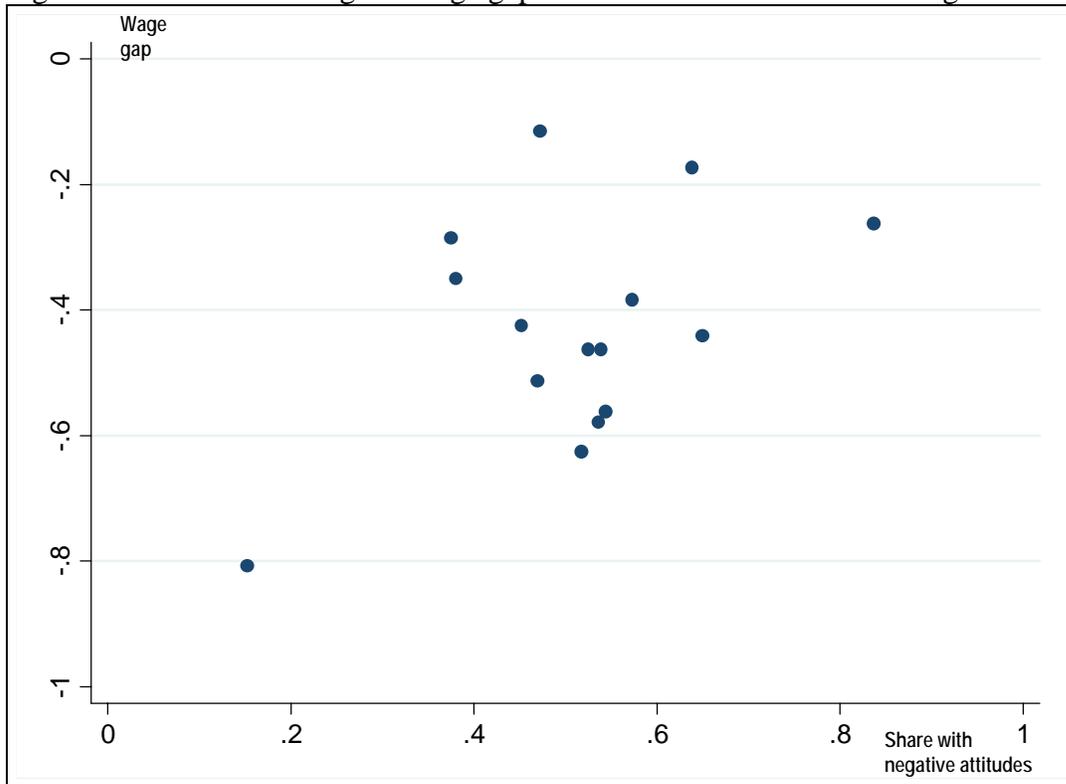
Riach, P. and Rich J. (2002) 'Field Experiments of Discrimination in the Market Place', *The Economic Journal*, 112:480–518.

Rooth, D-O (2010) "Automatic associations and discrimination in hiring: Real world evidence," *Labour Economics*, 17(3):523-534.

Waisman, G. and Larsen, B. (2008) "Do Attitudes Towards Immigrants Matter?"
Linnaeus Center for Integration Studies (SULCIS) Working Papers 2008:5, Stockholm
University, Stockholm, Sweden

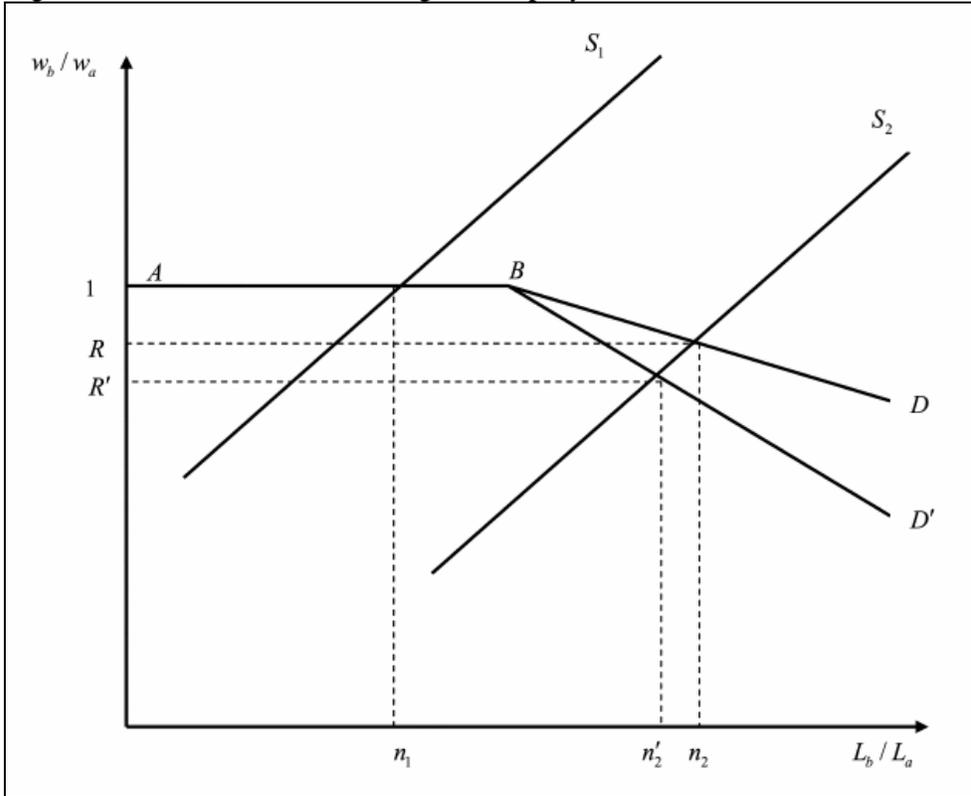
Figures:

Figure 1. The ethnic/immigrant wage gap in the EU and the share with negative attitudes.



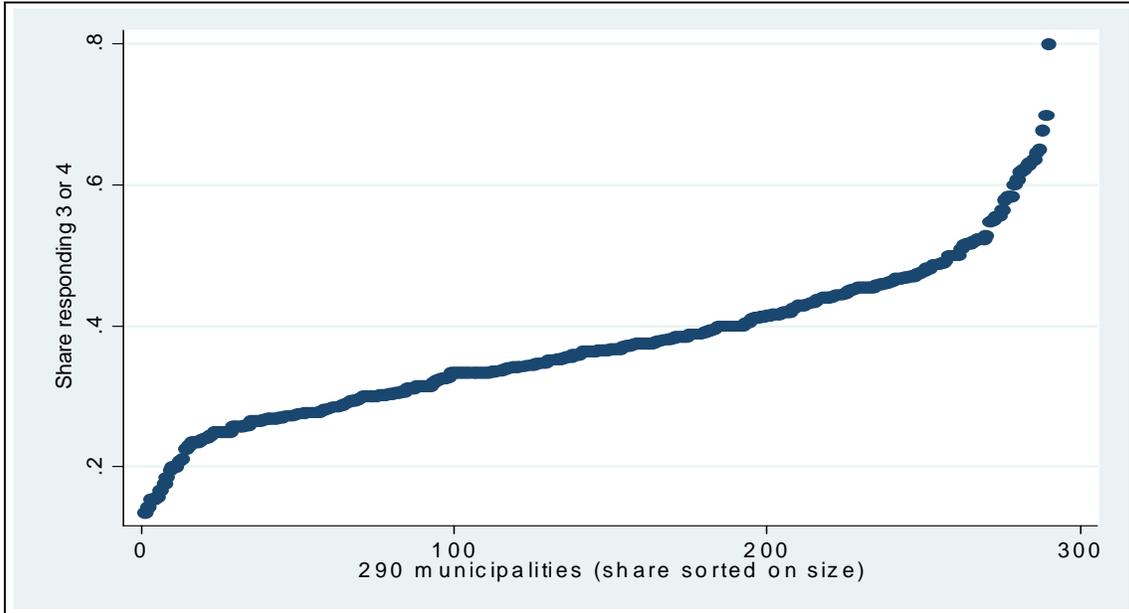
Note: Data on the ethnic/immigrant wage gap are taken from Adsera and Chiswick (2007) and the share with negative attitudes in the population is calculated from the European Social Survey by merging the results for waves 1-5. From the left (lowest level of prejudice) to the right (highest level of prejudice) in the Figure the countries are: Sweden, Ireland, Italy, Belgium, the Netherlands, Germany, Spain, France, Luxemburg, United Kingdom, Denmark, Austria, Portugal, Finland, and Greece.

Figure 2. The attitude of the marginal employer.



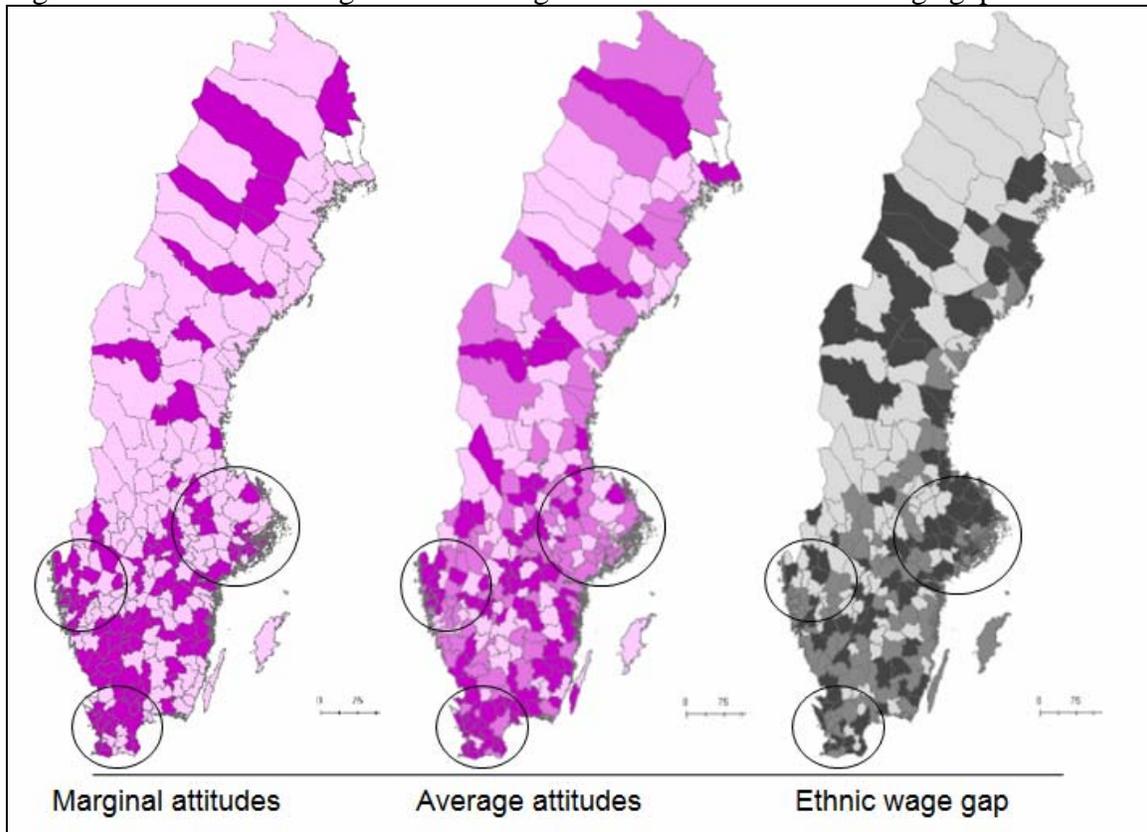
Note: This figure is taken from Charles and Guryan (2008).

Figure 3. The distribution of average attitudes across 290 Swedish municipalities. FSI-data 2000-2008.



Note: The share of respondents in a municipality answering *Not very valuable* or *Not valuable at all* to the question: What do you think of the immigrants that we have received regarding their contribution to the Swedish population? The two alternative answers were *Quite* and *Very valuable*.

Figure 4. Variation in marginal and average attitudes and the ethnic wage gap.



Note: For *marginal* attitudes light colors imply less, and dark more, negative attitudes of the marginal employers. For *average* attitudes and the ethnic wage gap their distributions are divided into three equal parts. Light colors then correspond to the least negative (lowest) third, medium colors to the middle third, and dark colors to the most negative (largest) third of *average* attitudes (ethnic wage gap). The circles enclose the Stockholm (largest circle), Gothenburg (medium circle) and Malmö LMAs. These three LMA regions account for 48 and 69 percent of the native and ethnic minority population, respectively.

Tables:

Table 1. Log earnings 2003 (Earnings > 100,000 SEK). N = 435,677.

FSI attitude measure	(1)	(2)	(3)	(4)	(5)	(6)
Minority	-0.05*** [0.00]	-0.04*** [0.01]	-0.02 [0.04]	-0.01 [0.01]	-0.03** [0.01]	-0.01 [0.03]
Share with negative attitudes	-	-	-0.16*** [0.06]	-	-	-0.13* [0.07]
Minority * share with negative attitudes	-	-	-0.05 [0.08]	-	-	0.02 [0.06]
Attitude of the marginal employer	-	-	-	0.02 [0.01]	-	0.03** [0.01]
Minority * attitude of the marginal employer	-	-	-	-0.05*** [0.01]	-	-0.04*** [0.01]
Attitude p90	-	-	-	-	-0.04*** [0.01]	-0.03** [0.01]
Minority * attitude p90	-	-	-	-	-0.02 [0.02]	-0.02 [0.01]
<i>Control variables</i>						
Age	-	0.07*** [0.01]	0.07*** [0.01]	0.07*** [0.01]	0.06*** [0.01]	0.06*** [0.01]
Age squared	-	0.001*** [0.0001]	0.001*** [0.0001]	0.001*** [0.0001]	0.001*** [0.0001]	0.001*** [0.0001]
Years of schooling	-	0.07*** [0.002]	0.07*** [0.002]	0.07*** [0.002]	0.07*** [0.002]	0.07*** [0.002]
Municipality fe	Yes	No	No	No	No	No
Share minority individuals in a region	No	Yes	Yes	Yes	Yes	Yes

Note: No additional controls other than those listed in the table. *, ** and *** denote the ten, five and one percent significance level, respectively. Reported standard errors (in brackets) are robust.

Table 2. Log earnings 2003 (Earnings > 100,000 SEK). N = 435,677.

FSI attitude measure	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Minority	0.04 [0.03]	0.04 [0.04]	0.01 [0.03]	0.03 [0.04]	0.00 [0.03]	-0.01 [0.03]	-0.03 [0.02]	0.02 [0.03]
Share with negative attitudes	-0.55*** [0.09]	-0.39*** [0.09]	-0.20*** [0.07]	-0.41*** [0.08]	-0.33*** [0.06]	-0.24*** [0.05]	-0.11*** [0.04]	-0.09*** [0.03]
Minority * share with negative attitudes	-0.02 [0.08]	-0.05 [0.08]	-0.03 [0.06]	-0.04 [0.08]	0.00 [0.07]	0.02 [0.07]	0.03 [0.05]	-0.08 [0.06]
Attitude of the marginal employer	0.11*** [0.02]	0.04* [0.02]	0.03** [0.01]	0.04** [0.02]	0.03* [0.01]	0.04*** [0.01]	0.03*** [0.01]	0.03** [0.01]
Minority * attitude of the marginal employer	-0.07*** [0.01]	-0.08*** [0.01]	-0.05*** [0.01]	-0.07*** [0.01]	-0.06*** [0.01]	-0.06*** [0.01]	-0.03*** [0.01]	-0.03** [0.01]
<i>Control variables:</i>								
Age	0.05*** [0.01]	0.05*** [0.01]	0.07*** [0.01]	0.05*** [0.01]	0.05*** [0.01]	0.05*** [0.01]	0.06*** [0.01]	0.06*** [0.01]
Age squared	0.001*** [0.0001]							
Years of schooling	-	-	0.07*** [0.001]	-	-	-	0.07*** [0.001]	0.07*** [0.001]
Share minority individuals in a region	No	Yes						
Regional unemployment	No	No	No	No	Yes	Yes	Yes	Yes
Regional ethnic cognitive gap	No	No	No	Yes	No	No	Yes	Yes
Immigrant characteristics (regional)	No	No	No	No	No	Yes	Yes	Yes
Shifted prejudice distribution	No	Yes						

Note: No additional controls other than those listed in the table. *, ** and *** denote the ten, five and one percent significance level, respectively. Reported standard errors (in brackets) are robust. *Shifted prejudice distribution* refers to the case when we assume that no employers belong to the ethnic minority when calculating the marginal prejudice measure, see Section 5.2.

Table 3. Log earnings 2003 (Earnings > 100,000 SEK). All occupations. N = 435,677.

FSI attitude measure	(1)	(2)	(3)	(4)	(5)	(6)
Minority	-0.02*** [0.01]	-0.01*** [0.00]	0.01 [0.02]	-0.03 [0.02]	-0.01 [0.04]	0.01 [0.04]
Share with negative attitudes	-	-	-	-0.11*** [0.04]	-0.15** [0.07]	-0.19** [0.08]
Minority * share with negative attitudes	-	-	-	0.03 [0.05]	-0.01 [0.10]	0.00 [0.08]
Attitude of the marginal employer	0.02** [0.01]	0.01 [0.01]	0.01 [0.03]	0.03*** [0.01]	0.01 [0.01]	0.05 [0.03]
Minority * attitude of the marginal employer	-0.03*** [0.01]	-0.04*** [0.01]	-0.07*** [0.02]	-0.03*** [0.01]	-0.04*** [0.01]	-0.07*** [0.02]
<i>t-value of first stage regressions</i>						
Share with negative attitudes	-	-	-	-	-	524
Attitude of the marginal employer	-	-	219	-	-	197
<i>FSI attitude measure at LMA level:</i>						
Reduced form	No	Yes	No	No	Yes	No
IV	No	No	Yes	No	No	Yes

Note: All models control for age, age squared, years of schooling, share minority individuals in a region, regional unemployment, regional ethnic cognitive gap, regional immigrant characteristics. *, ** and *** denote the ten, five and one percent significance level, respectively. Reported standard errors (in brackets) are robust.

Table 4. Log earnings 2003 (Earnings > 100,000 SEK). All occupations. N = 435,677.

FSI attitude measure	(1)	(2)	(3)	(4)	(5)	(6)
Minority	-0.02*** [0.01]	-0.02*** [0.01]	0.06* [0.03]	-0.03 [0.02]	0.03 [0.03]	0.07 [0.10]
Share with negative attitudes	-	-	-	-0.11*** [0.04]	-0.44** [0.18]	-0.17 [0.23]
Minority * share with negative attitudes	-	-	-	0.03 [0.05]	-0.46 [0.35]	-0.02 [0.13]
Attitude of the marginal employer	0.02** [0.01]	0.01 [0.01]	-0.12 [0.12]	0.03*** [0.01]	0.00 [0.01]	0.00 [0.21]
Minority * attitude of the marginal employer	-0.03*** [0.01]	-0.03*** [0.01]	-0.15*** [0.05]	-0.03*** [0.01]	-0.06*** [0.01]	-0.15** [0.07]
<i>t-value(s) of first stage regressions</i>						
Share with negative attitudes	-	-	-	-	-	381
Attitude of the marginal employer	-	-	55	-	-	4
<i>SD attitude measure:</i>						
Reduced form	No	Yes	No	No	Yes	No
IV	No	No	Yes	No	No	Yes

Note: All models control for age, age squared, years of schooling, share minority individuals in a region, regional unemployment, regional ethnic cognitive gap, regional immigrant characteristics. *, ** and *** denote the ten, five and one percent significance level, respectively. Reported standard errors (in brackets) are robust.

Appendix

Table A1. Descriptive statistics.

<i>Panel a) Variables at the individual level</i>	<u>Majority</u>		<u>Minority</u>	
Log earnings	12.37	(0.91)	12.27	(1.06)
Age	39.80	(3.14)	39.48	(3.12)
Years of schooling	11.96	(2.15)	12.14	(2.33)
Years of schooling missing	0.0008	-	0.0020	-
N	472,690		36,670	
<i>Panel b) Variables at the municipality level</i>				
Share with negative attitudes	0.45	(0.12)		
Attitude of the marginal employer	0.43	(0.50)		
Attitude p90	0.57	(0.50)		
Share with negative attitudes (shifted prejudice distribution)	0.50	(0.14)		
Attitude of the marginal employer (shifted prejudice distribution)	0.72	(0.45)		
Share with negative attitudes (SD attitude measure)	0.06	(0.03)		
Attitude of the marginal employer (SD attitude measure)	0.47	(0.50)		
Share minority	0.09	(0.06)		
Regional unemployment	0.07	(0.02)		
Regional ethnic cognitive gap	-0.69	(0.60)		
Share of refugees among the immigrants	0.03	(0.03)		
Share of immigrants from outside the EU	0.46	(0.13)		
Share on income support among the foreign born	0.14	(0.03)		
N	290			
<i>Panel c) Variables at the LMA level</i>				
Share with negative attitudes	0.44	(0.10)		
Attitude of the marginal employer	0.40	(0.49)		
N	78			

Note: This table reports the mean of variables at the individual, municipality, and LMA level, respectively. For continuous variables standard deviations are reported in parenthesis.

Table A2. Log earnings 2003 (Positive earnings). N = 477,643

FSI attitude measure	(1)	(2)	(3)	(4)	(5)	(6)
Minority	-0.16*** [0.01]	-0.15*** [0.01]	-0.15** [0.07]	-0.08*** [0.02]	-0.13*** [0.02]	-0.12* [0.06]
Share with negative attitudes	-	-	-0.13 [0.09]	-	-	-0.10 [0.11]
Minority * share with negative attitudes	-	-	0.01 [0.18]	-	-	0.14 [0.13]
Attitude of the marginal employer	-	-	-	0.02 [0.02]	-	0.04* [0.02]
Minority * attitude of the marginal employer	-	-	-	-0.10*** [0.03]	-	-0.10*** [0.03]
Attitude p90	-	-	-	-	-0.04** [0.02]	-0.03* [0.02]
Minority * attitude p90	-	-	-	-	-0.03 [0.04]	-0.04 [0.03]
<i>Control variables</i>						
Age	-	0.07*** [0.01]	0.07*** [0.01]	0.07*** [0.01]	0.07*** [0.01]	0.07*** [0.01]
Age squared	-	-0.001*** [0.0002]	-0.001*** [0.0002]	-0.001*** [0.0002]	-0.001*** [0.0002]	-0.001*** [0.0002]
Years of schooling	-	0.09*** [0.00]	0.09*** [0.00]	0.09*** [0.00]	0.09*** [0.00]	0.09*** [0.00]
Municipality fe	Yes	No	No	No	No	No
Share minority individuals in a region	No	Yes	Yes	Yes	Yes	Yes

Note: No additional controls other than those listed in the table. *, ** and *** denote the ten, five and one percent significance level, respectively. Reported standard errors (in brackets) are robust.

Table A3. Log earnings 2003 (Positive earnings). N = 477,643

FSI attitude measure	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Minority	-0.05 [0.07]	-0.06 [0.08]	-0.09 [0.07]	-0.06 [0.08]	-0.12* [0.06]	-0.13** [0.06]	-0.15*** [0.06]	0.01 [0.07]
Share with negative attitudes	-0.57*** [0.09]	-0.41*** [0.12]	-0.18* [0.10]	-0.43*** [0.12]	-0.32*** [0.08]	-0.20*** [0.07]	-0.04 [0.07]	-0.03 [0.06]
Minority * share with negative attitudes	0.05 [0.16]	0.02 [0.17]	0.04 [0.15]	0.02 [0.17]	0.10 [0.14]	0.13 [0.14]	0.12 [0.12]	-0.17 [0.15]
Attitude of the marginal employer	0.12*** [0.02]	0.04* [0.03]	0.04* [0.02]	0.05* [0.03]	0.03 [0.02]	0.04** [0.02]	0.03* [0.02]	0.05** [0.02]
Minority * attitude of the marginal employer	-0.13*** [0.03]	-0.14*** [0.03]	-0.10*** [0.03]	-0.14*** [0.03]	-0.11*** [0.02]	-0.11*** [0.02]	-0.08*** [0.02]	-0.08*** [0.03]
<i>Control variables:</i>								
Age	0.05*** [0.01]	0.05*** [0.01]	0.07*** [0.01]	0.05*** [0.01]	0.05*** [0.01]	0.05*** [0.01]	0.07*** [0.01]	0.06*** [0.01]
Age squared	-0.001*** [0.0002]							
Years of schooling	-	-	0.09*** [0.002]	-	-	-	0.09*** [0.00]	0.09*** [0.00]
Share minority individuals in a region	No	Yes						
Regional unemployment	No	No	No	No	Yes	Yes	Yes	Yes
Regional ethnic cognitive gap	No	No	No	Yes	No	No	Yes	Yes
Immigrant characteristics (regional)	No	No	No	No	No	Yes	Yes	Yes
Shifted prejudice distribution	No	Yes						

Note: No additional controls other than those listed in the table. *, ** and *** denote the ten, five and one percent significance level, respectively. Reported standard errors (in brackets) are robust. *Shifted prejudice distribution* refers to the case when we assume that no employers belong to the ethnic minority when calculating the marginal prejudice measure, see Section 5.2.