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Abstract

I investigate the effect of attitudes toward migrants on the average skill composition of immigrants in destination countries. A model is presented showing that negative attitudes toward migrants can reduce the average skill composition. The intuition for the result is that the highly skilled are more mobile and hence more sensitive to negative attitudes. To test the hypothesis, I use survey data on attitudes toward migrants as well as data on migrant stocks by education level and origin country. The empirical analysis is based on two classes of theoretical models and I find consistent evidence for the hypothesis that more positive attitudes increase the skill composition of immigrants. The results imply that general attitudes toward migrants can be relevant for policies seeking to attract highly skilled migrants.

JEL-Codes: F220, J150, J610.

Keywords: international migration, high-skilled immigration, immigration attitudes.

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1 Introduction

Immigration has remained a highly controversial issue in the public sphere for a long time. Especially with the recent influx of refugees in many countries, the topic has gained even more importance. It appears that most people have a strong opinion about immigration and politicians routinely use either pro- or anti-immigration rhetoric in their election campaigns. For different reasons, there seems to be a consensus, that high skilled immigration is preferable to low skilled immigration. Hainmueller and Hopkins (2015) for example find that Americans have a pronounced preference for well educated immigrants, who are in high skilled jobs. This is reflected in policy as well, with around two-thirds of OECD countries having either implemented or being in the process of implementing policies aimed at attracting highly skilled migrants (Czaika and Parsons, 2017). Surprisingly, the effect of attitudes has not received much attention in this context. This paper asks whether attitudes toward immigrants influence the skill composition of immigrants a country receives.

I will argue that negative attitudes toward immigrants decrease the average skill composition of immigrants. Therefore, a "welcoming culture" can be advantageous in attracting more highly skilled individuals from abroad. In this sense, the paper provides potentially new policy implications of the large literature[1] on the determinants of immigration preferences. Furthermore, I find that if fixed migration costs depend on skill transferability across countries, then migrants can become more sensitive to negative attitudes.

First, I will provide a theoretical model in the spirit of traditional migration models, which shows that it is possible for negative attitudes toward migrants to reduce the average skill level of migrants. To the best of my knowledge, this is the first model to unambiguously make such a prediction. I also provide a basic empirical test of the model and find support for the hypothesis using median age in destination countries as an instrument.

The intuition behind the result is that the highly skilled are more mobile. This could be because they have better outside options than low skilled migrants. Hence, the highly skilled can choose more freely where to migrate to and can leave a host country for another in case anti-migrant sentiments increase too much. The low skilled on the other hand may be "locked-in" a host country. Alternatively, the high skilled can afford to be more picky in choosing where to migrate to in the first place and may choose countries that have more positive attitudes toward them, whereas the low skilled take what they can get. Immigration policy often contributes to this, by making it easier to migrate for the college educated. Furthermore, bureaucratic requirements may be easier to fulfill for highly skilled immigrants[2]. Moreover, the highly skilled can be expected to have an easier time with adapting to another country, with collecting relevant information[3] and with learning a foreign language. By earning more, the highly skilled are also likelier to face less liquidity constraints when choosing to migrate from their origin countries[4] or from one host country to another. Furthermore, it is typically easier for a highly skilled migrant to find a job, because those with a college degree have an easier time transferring their credentials abroad than workers in the low skill sectors[5], who may have some knowledge of certain professions, but no formal training. As Munshi

[1] E.g. Card et al. (2012), Dustmann and Preston (2001), Facchini and Mayda (2009), Hansen and Legge (2017), Mayda (2006).
[2] Chiquiar and Hanson (2005) also make such an argument.
[3] Similar arguments are also given by Borjas (2014).
[4] Chiquiar and Hanson (2005) make a similar argument in the presence of borrowing constraints.
[5] A similar argument can be found in Zaiceva and Zimmermann (2014).

(2003) shows, networks are more important for the low skilled. Hence, the low skilled may have to invest (more) in a network to find a job, which involves fixed costs and limits mobility compared to the highly skilled. Such sunk costs will play an important role in the model.

As a motivating example, figure 1 shows the ratio of highly skilled migrants to low skilled migrants plotted against my measure of attitudes toward migrants. There is a statistically significant and positive correlation here, which requests an explanation. I will argue that it stems from an effect of attitudes toward migrants on migrant skill levels. This implies for example, that to the partial extent the vote on Brexit was driven by anti-migrant sentiments, it will rather be the highly skilled, such as bankers, who will leave Britain as a result, instead of low skilled workers.

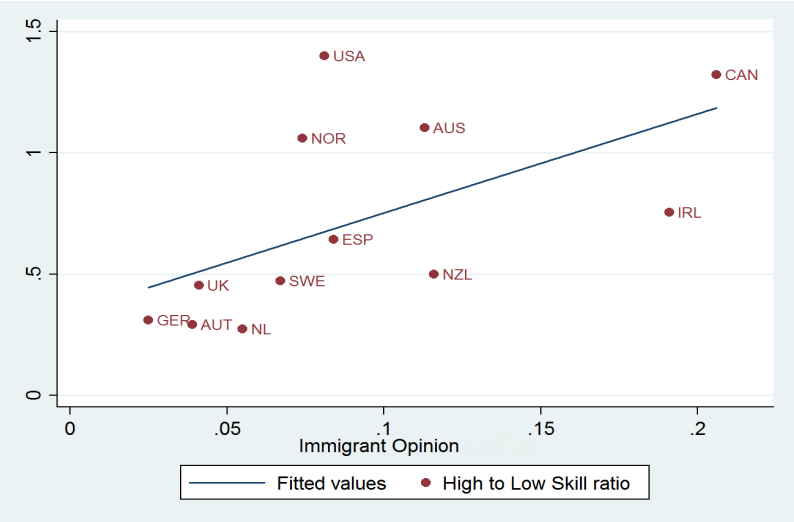

Figure 1: Average Migrant Skills and Attitudes

Data Sources: Brücker et al. (2013), ISSP Research Group (1998)

The rest of the paper is structured as follows. Section two reviews the relevant literature, while section three presents the model. Section four discusses the data sources, variables and empirical specification. Section five presents the empirical results, while section six concludes.

2 Related Literature

Attitudes toward migrants have been a research topic for some time, however, the first papers were concerned with the determinants and not the effects of attitudes. A major issue in examining the link between migration attitudes and the presence of migrants is a simultaneity or reverse causality bias. One of the first papers to address this issue was Dustmann and Preston (2001), by using instrumental variables to examine the effect of the local ethnic composition on natives' attitudes towards foreigners in the United Kingdom.

I contribute to the traditional literature on migrant sorting[6] and the literature on attracting highly-skilled migrants[7], both of which have largely been silent on the effects of attitudes toward migrants. The paper,

[6]See e.g. Borjas, Bronars and Trejo (1992), Dahl (2002) and Grogger and Hanson (2011).
[7]Czaika and Parsons (2017) is the first paper to test the effectiveness of policies targeting highly skilled migrants.

however, primarily contributes to the small, but growing, recent literature that studies the effects of attitudes on migration. Most studies, however, focus on the effects on the amount of migration, while not being primarily concerned with the effects on the migrant skill composition.

Several studies focus on violence, which is an extreme form of negative attitudes. Tolnay and Beck (1992) as well as Henry (2009) examine the effects of racial violence on location choice within the U.S. Friebel, Gallego and Mendola (2013) look at the effect of xenophobic attacks in South Africa on the migration intentions of Mozambicans and find negative effects. I will focus on negative attitudes in general, however, which are not (necessarily) related to violence.

Damm (2009) on the other hand looks at migrant location decisions in Denmark, but does not focus on the direct effects of attitudes toward migrants. Nonetheless, she finds that the hazard rate of relocation increases with the percentage of right-wing votes at the latest local election, but attributes this to right-wing parties restricting welfare for immigrants. Waisman and Larsen (2008) find evidence for labor market discrimination in Sweden and that negative attitudes are related to lower wages for migrants. Through this channel, they find that the location choice of immigrants is influenced by attitudes. While these studies focus on specific countries, Gorinas and Pytliková (2017) take a cross-country approach. They find that native hostility toward immigrants, especially natives' propensity to discriminate on the labor market, negatively influences the number of immigrants. Interestingly, as an additional exercise, they find that this propensity to discriminate is a major negative factor in the absence of formal entry barriers. They interpret this as suggesting that immigrants who are more free to choose their destination prefer countries with more positive attitudes toward migrants. I will argue that since the highly skilled are more free to choose their destination, they will react more strongly to negative attitudes. Hence, this finding from Gorinas and Pytliková (2017) corroborates my results.

To the best of my knowledge, the only three studies that mention the possible effects of attitudes toward migrants on the skill level of migrants are Coulon et al. (2016), Knabe et al. (2013) and Slotwinski and Stutzer (2015). While these papers focus on single countries, I take a cross-country approach. Although these studies are not directly concerned with the skill level of migrants, they still provide valuable insights. Of these papers, only Slotwinski and Stutzer (2015) offer a theoretical model. Nevertheless, their model focuses on location choice instead of immigration and is ambiguous on how the effects of negative attitudes differ across skill groups.

Coulon et al. (2016) use quasi-experimental data to determine the impact of Italian attitudes on the settlement intentions of Rumanian immigrants. The shock the authors exploit is the media coverage in response to a crime committed by a Romanian immigrant. They argue that the two main media companies handled the event differently, causing different exposures to anti-immigrant attitudes of migrants consuming the different television channels. Coulon et al. (2016) find a negative effect of negative attitudes on migrants' settlement intentions. Interestingly, they find a larger effect on the intentions of low skilled migrants. However, they identify the short-term impact of native attitudes, which may not materialize in the less educated migrants actually leaving at a higher rate. Therefore, their finding does not contradict mine. I argue that low skilled migrants, although affected by negative attitudes, do not have as much real possibility to actually leave, as the high skilled migrants do. Nonetheless, if the low skilled are affected more and do not leave, this can pose a large problem for integration. As the authors mention, low skilled migrants intending to return have lower incentives to invest in country specific skills.

Knabe et al. (2013) do not look at migration stocks or flows, but rather at the life satisfaction of migrants in Germany. As a measure of xenophobia, they use the share of votes received by extremist right wing political parties. They find that that, as right-wing extremism increases, the life satisfaction of immigrants is significantly reduced. Interestingly, they find stronger effects for highly educated immigrants. Hence, they also argue that policies seeking to attract the highly skilled should include a reduction natives' negative attitudes toward migrants. They do not provide a formal model, but base this argument on the assumption that life satisfaction matters for migration. Unfortunately, they do not have data on actual migration decisions and cannot estimate the rate at which immigrants leave or avoid moving to Germany. Hence, in a second step, they focus on migration intentions and find mixed results for the highly skilled. The authors show that life satisfaction is positively correlated with the intention to stay in Germany and find a positive interaction with education in cross-section regressions. This would indicate that the effects of negative attitudes captured by right wing extremism are more relevant for the highly skilled. However, this interaction seems to disappear with fixed effects.

Slotwinski and Stutzer (2015) use the vote on the Swiss minaret initiative as a natural experiment to identify the effect of negative attitudes toward immigrants on their choice of location within Switzerland. Their results show that the probability of moving to a municipality that unexpectedly revealed reservations toward migrants decreases initially by about 60%. They also provide a model, which combines a model of identity utility with a model of location choice. While their model predicts negative effects on location choice from negative attitudes, it leaves open the question of different effects by skill level. In reviewing the arguments from the literature, they conclude that, in theory, the skill group which suffers the highest loss of identity utility from negative attitudes is ambiguous in their context. Interestingly, they find empirically that the high-skilled group is most sensitive to the revelation of new information about citizens' attitudes towards foreigners, which is in line with the findings in my paper as well, although different theoretical considerations are underpinning the analyses.

3 Theory

The reason there has been little empirical research on this topic so far may be the lack of a clear theoretical prediction that attitudes toward migrants can affect the migrant skill composition. One of the earliest papers to formalize the discussion of migrant skills was Borjas (1987), who presented a model based on Roy (1951). According to this model, destination countries with higher returns to skill than origin countries would attract the highly skilled portion of workers from an origin country. This is known as positive selection. On the other hand, destination countries with lower returns to skill than origin countries will attract migrants from the lower end of the skill distribution and therefore exhibit negative selection. Here, negative attitudes could be interpreted as higher migration costs. In this model, such costs can affect the number of migrants[8], which in turn may affect the average skill composition. If negative selection is the case, then higher migration costs would reduce the average skill level of migrants. However, in case of positive selection, this model has the opposite conclusion. Therefore, I will analyze sorting[9] under both positive and negative selection.

[8] Indeed the literature of the effects of migration attitudes discussed in the introduction finds evidence of a negative effect on the amount (scale) of migration.

[9] This refers to the share of more educated migrants a country can attract, i.e. the skill composition of migrants

There is empirical evidence supporting the Roy model featured in Borjas (1987), especially for Puerto Rican migrants to the U.S.[10] However, this model has been disputed (see e.g. Feliciano 2005). In light of this, an alternative to the Roy model has been proposed by Grogger and Hanson (2011). While the Borjas (1987) model essentially implies log utility, Grogger and Hanson (2011) employ a framework of linear utility. In their model, absolute wage differences between the high and low skilled are the key factor. The larger these differences are, the more likely it is for a country to attract highly skilled migrants. In this framework, migration costs that affect all types of migrants have no effect on the type of selection or sorting that occurs. Nevertheless, migration costs that affect the high skilled less will increase the fraction of highly skilled migrants. Grogger and Hanson (2011) find substantial empirical evidence for their model, but no evidence for the Borjas (1987) model. On the other hand, a recent paper by Parey et al. (2017) does find support for the Borjas model.

I will not take a stance on which theoretical framework is correct and will regard both in the theoretical considerations and empirical estimation. The model presented here, however, is based on Borjas (1987). The presentation of the model is followed by a brief discussion on when the same effect can be expected within the Grogger and Hanson (2011) framework.

3.1 The Baseline Model

The general Borjas (1987) model can be simplified to a linear relationship between log wages and returns to skills, assuming earnings in destination and origin countries depend only on skills, which are perfectly transferable across countries (see e.g. Borjas 2014). In this section I will build on this simplified model to illustrate why attitudes toward migrants can affect the skill composition of migrants in the presence of both positive and negative selection. The most crucial change to the Borjas model is the introduction of sunk costs, which will drive the results.

There are two potential destination countries and one origin country in the model. Subscripts $i \in \{1, 2\}$ will denote the destination countries, whereas a subscript 0 refers to the origin country. All variables of this section are presented in discounted, net present value terms and agents are infinitely lived. We have the following utility from staying at the origin:

$$U_0 = lnW_0 = \alpha_0 + r_0\, s \tag{1}$$

W denotes net wages, r denotes returns to skill, s denotes the number of skill units a worker has and α is a constant. If a worker moves, she will incur costs of $F(s)$, which depend on her skill level. $F(s)$ is positive at all skill levels and decreasing in skills. Such an assumption is also made in Chiquiar and Hanson (2005), who extend the Borjas (1987) model. One argument they give to justify that costs are decreasing in skills, is the fact that legal migrants must fulfill many bureaucratic requirements, which may be easier for the higher skilled. Another is the presence of credit constraints, which may be tighter for the low skilled who face higher borrowing costs, as they are likely to be low income individuals. Moreover, this assumption

[10] See Borjas (2008) and Ramos (1992).

can also be justified through the lower cost of finding a job for the high skilled, which results from their higher transferability of human capital[11]. Further, Munshi (2003) finds that networks matter more for the low skilled, meaning the highly skilled may have to invest less into a network to be able to find a job abroad and hence have lower moving costs. A further reason could be the potentially higher information collection proficiency and adaptability of the highly skilled[12]. Here, the costs $F(s)$ are sunk after the worker moves, as these only represent moving costs. Due to the linearity of the model, I also assume linear sunk costs:

$$F_i(s) = F_i - \beta_i \, s \tag{2}$$

Migrants further incur other costs, which are not sunk after they arrive, as they are experienced daily, denoted γ_i. These may include factors such as cultural differences, which reduce migrants' net utility. For our purposes, the main component of this cost factor are attitudes toward migrants. More negative attitudes toward migrants reduce their utility and correspond to a higher γ. For the migrants' utility in the destination countries, if all of them were to migrate, we have:

$$U_i = lnW_i = \alpha_i + r_i \, s - \gamma_i - F_i(s) = \alpha_i + r_i \, s - \gamma_i - F_i + \beta_i \, s \tag{3}$$

There is a measure 1 of skills in the population of the origin country, which is uniformly distributed on [0,1]. The events occur over two periods. In the first, there is migration from the origin country to one of the destination countries. In the second, one of the destination countries unexpectedly increases its negative attitudes toward migrants, which causes some of their migrants to reoptimize and leave. In the first period both destination countries are equally attractive implying $\alpha_1 = \alpha_2$, $r_1 = r_2$, $\beta_1 = \beta_2$, $\gamma_1 = \gamma_2$ and $F_1 = F_2$.

I begin with the case of positive selection, meaning $r_i > r_0$. To ensure that some workers remain in the origin country, the condition $\alpha_i - F_i - \gamma_i < \alpha_0$ is necessary. By comparing equations (1) and (3), we see that workers with skills above a certain point will choose to emigrate from the origin country, while the lower skilled stay behind, in line with positive selection. This cutoff point is denoted s^*. The workers who choose to emigrate have skills of:

$$s > s^* = \frac{\alpha_0 - \alpha_i + \gamma_i + F_i}{r_i + \beta_1 - r_0} > 0 \tag{4}$$

The average skills of the migrant population that leave the origin country is given by:

$$E[s|s > s^*] = \int_{s^*}^{1} s \frac{1}{1 - s^*} ds = \frac{1 + s^*}{2} \tag{5}$$

[11] Zaiceva and Zimmermann (2014) mention a similar argument.

[12] A similar argument can be found in Borjas (2014).

A higher s^* corresponds to higher average skills of the migrant population. As both destinations are equally attractive, I assume they receive the same average skill level of migrants.

In the second period, suppose that country 1 unexpectedly has more negative attitudes toward migrants, causing γ_1 to increase by $(1+\delta)$. We now have $\gamma_1 = \gamma_2(1+\delta)$, since in period one we had $\gamma_1 = \gamma_2$. For the migrants in country 1, the moving costs are already sunk and so $F_1 = \beta_1 = 0$. For those still in the origin country, nothing has changed. They previously did not prefer country 1 or 2 and now that country 1 offers them even less net utility, they still choose to not migrate. For the migrants in country 2 there has not been any change either. They now strictly prefer country 2 and hence choose to remain there. However, migrants in country 1 now reoptimize. A migrant of skill s now chooses to leave country 1 for country 2 if:

$$\alpha_1 + r_1\, s - \gamma_1 < \alpha_2 + (r_2 + \beta_2)\, s - \gamma_2 - F_2 \tag{6}$$

Simplifying yields the condition for leaving:

$$s > \frac{F_2 - \gamma_2\, \delta}{\beta_2},\ s \in [s^*, 1] \tag{7}$$

Condition (7) shows that the upper end of the skill spectrum of migrants will choose to leave. Hence, as a result of an increase in negative attitudes, the average skill composition of migrants in country 1 decreases. Furthermore, this effect increases with the increase of the negative attitudes δ. Note that we do not need to check whether some migrants will choose to go back home, as this is impossible. We know from the analysis of the first period, that all of the migrants of country 1 prefer country 2 to their origin country. Hence, even if all the migrants of country 1 decide to leave, they would prefer country 2 over country 0.

Equation (7) of course is valid even if there is no change in migration attitudes, i.e. for $\delta = 0$. However, in that case it will imply that no one leaves country 1, meaning the preferences of the migrants are consistent over time. To see this, recall that $F_2(s) > 0\ \forall s$. This implies $\frac{F_2}{\beta_2} > s\ \forall s \implies \frac{F_2}{\beta_2} > 1$, as $s \geq 1$. Therefore, if $\delta = 0$ condition (7) becomes:

$$s > \frac{F_2}{\beta_2} > 1 \tag{8}$$

Hence, in that case only migrants with skill level higher than 1 would leave. However, such migrants do not exist in the model. It is possible that in response to an increase in negative attitudes, either all or none of the migrants leave. However, to the extent that some leave, the average skill level will fall.

I now turn to the negative selection case. This means that $r_i + \beta_i < r_0$ and $\alpha_i - F_i - \gamma_i > \alpha_0$ to ensure an interior solution for the cutoff point s^*. Here, the destination countries receive the lower end of the origin country's skill spectrum. The migrant population consists of workers with skills $s < s^*$. The average skills

of the migrant population that leave the origin country 0 is now given by:

$$E[s|s < s^*] = \int_0^{s^*} s\frac{1}{s^*}ds = \frac{s^*}{2} \tag{9}$$

The average skill composition is again a positive function of the cutoff point s^*. For negative selection the general Borjas (1987) model can be interpreted to mean that the average migrant skill composition goes down if negative migration attitudes increase. This can also be seen here. As s^* is decreasing in γ, equation (9) shows that the average skills will also decrease. In that case, the highest skilled (among the low skilled pool of migrants) are less inclined to move to countries with more negative attitudes in the first place. Proceeding as before for the second period, the skill level of migrants who leave in response to increased negative attitudes will be:

$$s > \frac{F_2 - \gamma_2\,\delta}{\beta_2},\ s \in [0, s^*] \tag{10}$$

Even though the destination countries received the migrants with the lowest skill level from the origin country, the highest skill of those will leave in response to an increase in negative attitudes toward migrants. Interestingly, Ramos (1992) finds some empirical evidence for such a case. He looks at Puerto Rican migrants to the U.S. and finds evidence of negative selection and that the pool of returnees tends to be more skilled than those who remain.

Therefore, the decrease in average migrant skills in response to negative attitudes toward migrants occurs regardless of the type of selection that the destination countries experience. This occurs, even though attitudes toward migrants reduce utility equally for migrants of all skill levels. The intuition is that, as destination country 1 becomes less attractive, migrants would like to leave. However, those with lower costs of leaving are the ones who find it more worthwhile to actually do so. Therefore, workers with higher skills, who we expect to be more mobile, will in fact be the ones who leave in response to increased negative attitudes. Indeed, Gorinas and Pytliková (2017) find empirically that migrants who are more free to choose their destination choose countries with more positive attitudes toward migrants. However, more free in their context refers to the absence of formal entry barriers and not education differences.

The results here are driven by the sunk costs. Without them, all migrants would always leave in response to more negative attitudes. The sunk cost aspect of migration is what causes a kind of "lock-in" effect for the lower skilled in this model. The temporary migration that arises in the model is not a rare phenomenon. Dustmann and Görlach (2016) for example find that ten years after arrival, around 50 percent of a cohort of migrants to European countries have left. They also find that the fraction of migrants who intend to stay permanently is lower for the very highly skilled. This intention could reflect the perceived higher mobility of the highly skilled.

This model shows that even negative attitudes experienced equally by both groups of migrants can cause the highly skilled to react more strongly. In the Grogger and Hanson (2011) framework, costs that affect

both groups equally have no effect on sorting. Nevertheless, if costs affect the higher skilled more, then in their model we obtain the same result presented here. Among the factors that they control for in their empirical analysis are visa waivers in general, anglophone destinations and so on, which apply equally to both high and low skilled migrants. Nevertheless, they consider that these factors may produce asymmetric responses between the high and low skilled. If attitudes toward migrants interact with factors that allow the highly skilled to be more mobile, then we might again expect an asymmetric response, as predicted by the model above. In that case, attitudes can become relevant in their model as well.

3.2 Imperfect Skill Transferability

This section relaxes the assumption of perfect skill transferability between countries. Nevertheless, I maintain that skills are the only relevant factor for deviations from mean income. A simple way to introduce imperfect correlation of skills is to assume the following processes:

$$lnW_0 = \alpha_0 + r_0\, s \tag{11}$$

$$lnW_i = \alpha_i + r_i\, s^t - \gamma_i - F_i(s),\ t > 1 \tag{12}$$

Here t represents a measure of (inverse) skill transferability. For $t > 1$, skills abroad are worth less than at home[13], since $s \leq 1$. Furthermore, the percentage loss is decreasing in the skill level. For $s = 1$, there is no loss of skills, while there is a stronger loss, the lower the skill level. This reflects the higher skill transferability of the higher skilled[14]. To see this, denote the percentage of skills lost when migrating as L.

$$L = s^{t-1} - 1 < 0 \tag{13}$$

$$\frac{d|L|}{ds} = -(t-1)s^{t-2} < 0,\ \frac{d|L|}{dt} = -ln(s)s^{t-1} \geq 0 \tag{14}$$

Therefore, the value of skills decreases when moving abroad and this loss is lower for higher skill levels. Furthermore, a higher t corresponds to a larger discount of skills abroad. The correlation of skill between the origin and destination country is then given by:

$$0 < Corr(s, s^t) = \frac{\sqrt{6t+3}}{t+2} < 1 \tag{15}$$

[13] Except for the corners of the skill distribution

[14] Zaiceva and Zimmermann (2014) for example also mention the higher transferability of the highly skilled.

$$\frac{dCorr(s, s^t)}{dt} = \sqrt{3}\frac{1-t}{(t+2)^2\sqrt{2t+1}} < 0 \tag{16}$$

Therefore, a higher t corresponds to a lower correlation between skills at home and abroad. Hence, a larger t can be interpreted as lower skill transferability. Note that for $t = 1$, we are in the case of the previous section, which implies perfect correlation.

The analysis for the first period migration is analogous to the previous section. Since lnW_i is monotonically increasing in s, there will again be a unique cutoff point s^* below or above which migration occurs, if such a cutoff exists. If s^* does not exist, then either everyone or no one from the origin country migrates.

Suppose that the fixed costs are still linear in skills and therefore given by equation (2). Then, we have the same response to negative attitudes as in the previous section, which is given by equations (7) and (10).

Suppose now that the fixed costs also depend on the skill transferability:

$$F_i(s) = F_i - \beta_i\, s^t \implies \frac{dF_i(s)}{dt} \geq 0 \tag{17}$$

We still have that the fixed costs are decreasing in the skill level. Additionally, there are higher fixed costs of migration, if there is a lower transferability of skills. In general, a lower transferability acts as an additional cost of migration in the model. Equation (17) then could imply that a portion of this cost is sunk. An alternative interpretation is that lower transferability could require higher levels of other fixed costs in order to successfully move. For example, they may need to invest more in networks in order to find a job, because their skill transferability has decreased. Such investments for example can have a fixed component.

Suppose we have the same case as in the previous section, with $\alpha_1 = \alpha_2$, $r_1 = r_2$ and an unexpected increase of negative attitudes in country 1 with $\gamma_1 = \gamma_2(1+\delta)$. Then, in response to these negative attitudes all migrants in country 1 with the following skill level will leave:

$$s > \hat{s} = \Big(\frac{F_2 - \gamma_2\,\delta}{\beta_2}\Big)^{t^{-1}} \tag{18}$$

Hence, the most skilled migrants of a country will leave in response to the unexpected increase in negative attitudes. Therefore, the results from the previous section are robust to imperfect skill correlation across countries. Furthermore, $\hat{s}$ can be seen as capturing the sensitivity of migrants to negative attitudes. This extended model now allows for results regarding the effects of skill transferability. It follows that:

$$\frac{d\hat{s}}{dt} = -ln\Big(\frac{F_2 - \gamma_2\,\delta}{\beta_2}\Big)\Big(\frac{F_2 - \gamma_2\,\delta}{\beta_2}\Big)^{t^{-1}} t^{-2} \geq 0 \tag{19}$$

Therefore, lower skill transferability implies that migrants are less sensitive to negative attitudes. As

transferability decreases, only the highest skilled migrants will leave in response to negative attitudes. In that case, the average skill composition is reduced less compared to a higher degree of transferability. For sufficiently low transferability, there will be no reaction to negative attitudes at all. Therefore, as globalism potentially increases skill transferability, we might expect migrants to become more sensitive to negative attitues in the future.

To summarize, I have discussed three theoretical possibilities under which we can expect negative attitudes toward migrants to decrease the average migrant skill composition. One possibility is the Borjas (1987) model, if negative selection is the case. Another possibility is the Grogger and Hanson (2011) model, if attitudes affect the highly skilled more strongly. Lastly, the model presented here implies that if suitable alternative destinations exist and moving costs are decreasing in skills, then negative attitudes have a negative effect, regardless of the type of selection.

4 Data and Empirical Specification

I use observational data for a first basic test of the model. While quasi-experimental data would be optimal, it is very difficult to find credible sources of exogenous variation in this context. Attitudes do not change from one day to the other. Even surprising election results may be surprising to pollsters, but not necessarily to the migrants affected by attitudes. Negative media portrayal is also unlikely to be exogenous, as it is linked to events concerning migrants, which in turn can depend on the migrant skill composition of a country. Furthermore, the model does not imply a difference in migrants' intentions or satisfaction, but rather a difference in the actual opportunities for high and low skilled migrants to react to attitudes. As moving typically requires time, it is difficult to identifiy the effects of attitudes using shocks, since many other shocks can occur in the time it takes for migrants to move. Lastly, it seems relevant to look at cross-country data with a question concerning international migration, for which there is unlikely to be a natural experiment on a global scale. Hence, it seems that observational data is in most cases necessary. I attempt to identifiy the effects of negative attitudes by using median age in the destination countries as an instrument, in order to provde a first basic empirical test of the model.

There are twelve destination countries in the sample, with data on all possible source countries. I have taken all destination countries for which data on both migrant skills and attitudes are available. These are: Australia, Austria, Canada, Germany, Ireland, the Netherlands, New Zealand, Norway, Spain, Sweden, the U.K. and the U.S. Although this is not an exhaustive list of host countries, it is likely to include a substantial share of the world's immigrants.

As the model predicts costs, such as attitudes toward migrants, are relevant for sorting, I attempt to control for other possible cost factors. Controls that are purely bilateral are not included, as they cannot be correlated with the immigrant opinion variable, which is destination based. As the migration stocks in the data have accumulated over time, I average the control variables over a ten year period, where possible.

4.1 Attitudes toward Migrants

Studies involving attitudes toward migrants often use survey data[15]. Similarly, I use data from the 1995 National Identity module of the International Social Survey Programme (ISSP)[16]. This data has been used in Mayda (2006) and Facchini and Mayda (2009) to study the factors affecting attitudes toward migrants. I follow them in constructing my attitude variable, which will be referred to as "immigrant opinion" and focus on the same survey question as they do:

There are different opinions about immigrants from other countries living in (respondent's country). By immigrants we mean people who come to settle in (respondent's country). Do you think the number of immigrants to (respondent's country) nowadays should be: (a) reduced a lot, (b) reduced a little, (c) remain the same as it is, (d) increased a little, or (e) increased a lot.

As Mayda (2006) points out, responses to this question are highly correlated with the other migrant attitude responses. Hence, using a different question should not change the results. Following the literature, I exclude individuals who are not citizens of the country they are interviewed in, non-respondents and those who do not know the answer. Again following the literature, the variable is converted to 1 for respondents who would like the number of immigrants to increase (either a little or a lot) and to 0 otherwise. The immigrant opinion variable for each country is equal to the average of this measure. Hence, it captures the fraction of respondents in a country that have positive migrant attitudes. An additional approach used in Mayda (2006), but not continued in Facchini and Mayda (2009), is to assign numerical values to each response. This does not seem appropriate here, as the responses are categorical variables.

ISSP data on attitudes toward migrants is not available for all countries. An alternative could be to use data from the World Values Survey (WVS)[17]. Nevertheless, there are several issues with this approach. First, this survey was conducted over several years and data for 1995 is only available for two countries for which I have migration data. Second, using WVS instead of ISSP does not provide a greater coverage of countries. Even when using waves 2 and 3 of the WVS, which covers the time frame from 1990-1998, the WVS only has data on 10 countries for which I have migration data, whereas the ISSP has data on 12. The countries the WVS includes, which the ISSP does not and for which migration data is available are Chile, Finland and Switzerland. It does not, however, include important destination countries such as the Netherlands, Canada and the United States. Hence, relying only on WVS data is not ideal. Third, it does not seem sensible to combine the WVS data with the ISSP data, as the questions asked differ.

The immigrant opinion variable captures attitudes toward migrants in general. Nevertheless, attitudes may vary by the immigrant's skill level or origin country. I use this measure, however, as the model presented here is based on attitudes toward migrants in general. Furthermore, it is likely that migrant groups solidarize to some degree and that high skilled migrants are also unhappy if low skilled migrants are targeted negatively. For example, Wesselmann, Bagg and Williams (2009) find that individuals identify with the victims of ostracism. Furthermore, they experience personal distress beyond empathy, which is akin to being the target of ostracism. In the context of migration, Slotwinski and Stutzer (2015) indeed find evidence that

[15] See e.g. Dustmann and Preston (2001), Gorinas and Pytliková (2017) and Waisman and Larsen (2008).

[16] ISSP Research Group (1998).

[17] Mayda (2006) additionally uses this data, but Facchini and Mayda (2009) do not. Gorinas and Pytliková (2017) use the Integrated Values Survey, which is comprised of the World Values Survey and the European Values Survey.

non-Muslim migrants are affected by increased negative attitudes toward Muslims. Furthermore, negative attitudes are very often expressed generally in the media and public opinion. Moreover, the highly skilled may be more exposed to the negative attitudes, even if the low skilled are being targeted. This could be due to language skill differences or personal interest that may make the highly skilled more avid consumers of the destination country's media and political discourse[18]. Lastly, in daily interactions with migrants, natives cannot necessarily distinguish immediately between the high and low skilled. Hence, the high skilled can also be affected by negative attitudes, even if the native population is mostly against low skilled migration.

4.2 Migrant Stocks

Following the literature, I look at the emigration rate for each source-destination pair by education. The emigration rate is defined as the stock of migrants from a certain source-destination pair divided by the pre-migration population. The pre-migration population is defined as the sum of residents and migrants (from all destinations) for each source country. The outcome variable is the natural logarithmic difference of the emigration rate for high and low skill for each source-destination pair. I take this measure, because it is the theoretically implied outcome variable in the Grogger and Hanson (2011) model, which can also be used to test the Borjas model. This variable will be referred to as the skill ratio. A higher skill ratio indicates that a destination country is attracting migrants with higher skills.

The data on migrant stocks comes from the IAB brain-drain database by Brücker et al. (2013). They provide data on the total number of foreign-born individuals aged 25 years and older by gender, country of origin and educational level. They also provide emigration rates for source countries, but do not provide data on emigration rates by source-destination pair, which is required here. Nevertheless, it can be computed it from the data they provide, for which only the pre-migration population is missing. It is computed by summing the number of migrants from a given source and education level over all destinations and then dividing by the emigration rate provided by Brücker et al. (2013).

An issue could be that some migrants may have been motivated by educational opportunities abroad. Nevertheless, the data set addresses this issue by only considering individuals above the age of 25. Brücker et al. (2013) et al. distinguish three educational categories: primary, secondary and tertiary. I take primary to correspond to low skilled, while tertiary corresponds to high skilled. Here, primary includes lower secondary, primary and no schooling, whereas tertiary includes those with education higher than a high-school leaving certificate or equivalent.

While there are many different possible sources for migration data, most of them only provide data for the year 1990 or 2000. The ISSP data for migration attitudes is only available for the years 1995, 2003 and 2013. Unfortunately, it was impossible to find migration data for the years 2003 and 2013. To avoid making possibly wrong imputations I therefore use the 1995 wave of the ISSP. I use Brücker et al. (2013), since it is the only source providing data on migration stocks by education for the year 1995.

[18] A similar argument is also given in Slotwinski and Stutzer (2015).

4.3 Wage Measures

Much consideration has been given to the role that wages play in migration decisions. Grogger and Hanson (2011) find that absolute wage differences play the key role here. According to their model, wage differences for high and low skilled labor in destination countries are relevant for sorting. In the Borjas (1987) model, returns to skill in the destination countries emerge as relevant. I will use both both wage measures in the regressions. Returns to skills are estimated by differencing the natural logarithm of the high and low skilled wage measures. This corresponds to estimating the returns according to both theoretical models.

I use two data sources for wages. The first is the Luxembourg Income Study Database (2017) (LIS). Due to difficulties in mapping education categories from their migration data to the LIS, Grogger and Hanson (2011) look at the quantiles of each country's earnings distribution. They take the 20th percentile as their measure of low-skill and the 80th percentile as their measure of high-skill wages, but report that using other percentiles does not affect their results. As I have similar difficulties, due to the similar nature of my migration data, I do the same.

The second source is Oostendorp (2012), who expands and updates the Freeman and Oostendorp (2000) data. This source contains information on monthly earnings by occupation and industry from the International Labor Organization and is standardized to correct for differences in how countries report earnings. Grogger and Hanson (2011) use Freeman and Oostendorp (2000) data and take wage earnings corresponding to the 10th percentile as low skill and those at the 80th percentile as high-skill wages. Following them, I use the same percentiles.

The LIS database does not include New Zealand, whereas Oostendorp (2012) does not include Spain. Hence, using both provides a robustness check in terms of different data sources and in terms of excluding one country. More details can be found in the appendix.

4.4 GDP per Capita

According to Mayda (2006), GDP per capita is a good predictor of the skill composition of migrants relative to natives, which she uses as an indirect measure. She further finds evidence that individual skill is positively (negatively) correlated with pro-immigration preferences in countries where the skill composition of natives relative to migrants is high (low). This is consistent with economic motives. If migrants are less educated than natives, relative wages for the highly educated natives will increase. Hence, the economic effect of migrant skills on attitudes toward migrants depends on the skill composition of natives relative to migrants, which is captured by GDP per capita. According to these results, including GDP per capita as a regressor should largely deal with the economic channel of reverse causality of migrant skills on attitudes toward migrants in my empirical specification. My data on GDP per capita comes from the World Bank's World Development Indicators, which is based on purchasing power parity (PPP) and expressed in constant 2011 international dollars. As data on GDP per capita from the World Bank was not available for 1985-1989, I take the average from 1990-1995.

4.5 Migration Policy

As in most studies in this area, migration policy must be taken into account here to avoid omitted variable bias. Docquier, Rapoport and Salomone (2012), who study the relationship between remittances, migrants' education and policy, discuss the proxies in the literature and offer their own measures of migration policy. They note, however, that there is currently no reliable database.

They use three proxy variables to capture the restrictiveness of migration policy. These are the existence of bilateral guest worker programs, the proportion of refugees among migrants and the proportion of females among migrants. The proportion of refugees is thought to increase low skilled migration. The proportion of females is meant to capture the ease of family reunion, which is also believed to increase low skilled migration. To proxy the selectivity of migration policy, they use the existence of a points system and later on introduce regional dummies.

For my setting, it is inappropriate to use bilateral measures, as these would be uncorrelated with attitudes, since bilateral data on attitudes is not available. As immigrant opinion does not vary by source country, it will be uncorrelated with any policy measures that do vary across source countries, thereby making them irrelevant here. Hence, I do not take the existence of bilateral guest worker programs or bilateral free movement agreements into account. I also do not take regional dummies, as these are likely to also capture other features besides policy and the low number of clusters does not allow the inclusion of so many variables. I do, however, take all other proxies used in Docquier et al. (2012). The measure in Ortega and Peri (2009) and Mayda (2010), which looks at changes in the restrictiveness of migration policy is inappropriate here, as countries can make their policies stricter, while remaining relatively lax.

Following most studies, my data for the share of asylum seekers comes from the OECD (2006, 2005, 2004, 2003, 2001a, 2001b). However, data on the total number of migrants for some countries over the relevant time frame. For Spain this data is entirely missing. Since the number of countries is already low and interpolation may be unreliable, I instead normalize the number of asylum seekers by population. Data on population comes from the World Bank's World Development Indicators. I average the share of asylum seekers from 1990 to 1995. Where possible, I also construct the traditional measure of asylum seekers over the total number of migrants. The correlation coefficient of these two asylum seeker shares is 89,5%, thereby giving reason to believe that the two are capturing the same effects. The traditional measure, however, can only be used here in regressions without Spain. As Spain is excluded in regressions using Oostendorp (2012) data, it is possible to use it in those regressions. The results, however, are robust. Hence, for comparability and parsimony I only report regressions using asylum seekers over population.

The proxies of immigration policy used here are therefore the variables "points", "family" and "asylee share". "Points" is a dummy equal to 1 if a country had a points system in 1995. "Family" is the proportion of female migrants of any skill level and "Asylee Share" refers to the share of asylum seekers. This is a nearly exhaustive list of the main policy measures that have been used in the literature, which are applicable.

4.6 Social Expenditures, Anglophone Countries, Networks and Age

The extent of the welfare-state may be relevant to both the sorting of migrants[19] as well as attitudes toward migrants[20]. I therefore include a measure of social expenditure of the destination countries, averaged from 1985 to 1995. The measure includes all types of social expenditure and is expressed in per capita terms at constant (2010) US dollars. This data comes from the OECD Social Expenditure Database (OECD, 2017).

Grogger and Hanson (2011) find that immigrants in English speaking destinations are more educated relative to their non-migrant countrymen than immigrants in other destination countries. As half of the destinations I consider are anglophone and may have common attitudes toward migrants due to historic factors, I include this control in the regressions.

Munshi (2003) finds that networks play a role for migration, possibly benefiting the less educated more. Furthermore, it is likely that the presence of migrants itself can influence opinions about migrants. Some studies use historic bilateral colonial relationships and the total number of migrants by source-destination pair to control for networks. As bilateral variables will be uncorrelated with immigrant opinion, I take the total number of migrants that a destination country had in 1985, normalized by host country population. Indeed, bilateral migrant stocks have a very low correlation coefficient with immigrant opinion of -0.0054, as predicted. The total number of migrants on the other hand has a correlation coefficient of 0.457.

To deal with reverse causality, I use the median age in the destination country as an instrument for immigrant opinion. Mayda (2006) finds a significant and negative effect of age on attitudes toward migrants in many of her empirical specifications. The data comes from the United Nations, Department of Economic and Social Affairs, Population Division (2015). I take the values in 1995, as this is the only year data on immigrant opinion is available.

5 Regression Analysis

There are four main specifications in the regressions. I test my hypothesis based on the model presented here, which expands upon a linearized Borjas model and is based on returns to skills data. I further test the hypothesis based on the model in Grogger and Hanson (2011), which calls for data on absolute wage differences. For each of these models, I use two sources of wage data, as discussed. I look at migrant stocks by gender, but also consider regressions pooling the observations for males and females.

The dependent variable is the previously defined skill ratio. A higher skill ratio means that a destination country is attracting more highly skilled migrants from a source country. The unit of observation is the origin-destination country pair by gender. The variable of interest is the immigrant opinion variable, where a higher value corresponds to more positive attitudes toward migrants. Due to the low number of clusters, it is impossible to reasonably add more controls beyond those discussed in section 4, as this would lead to more regressors than clusters. Nevertheless, there are no major controls from the literature that are missing.

The standard errors are clustered at the destination country level. I only have 11 clusters, however,

[19] See Boeri (2010), De Giorgi and Pellizzari (2009).
[20] See Facchini and Mayda (2009).

which may be too few and is often a feature of papers using such data. I take two precautions to deal with this issue. The first is to use critical values from the T(G-1) distribution, where G is the number of clusters, as recommended by Cameron and Miller (2015), which leads to more stringent thresholds for significance. Furthermore, I report two sets of t-statistics for immigrant opinion. The first, reported immediately under the coefficients in parentheses, are computed using the standard sandwich estimator for clustering. The second, below them in square brackets, are computed using a parametric correction by applying the Moulton factor (Moulton, 1986). This alternative is suggested by Angrist and Pischke (2009, p. 312), who provide Stata code (Pischke, 2008)) for OLS corrections. I also apply this correction to the IV regressions, by expanding this code. Indeed in many cases this parametric correction did provide lower t-statistics. An alternative would be the bias reduced linearization procedure to correct for clustering, however, this requires regressors to vary within clusters and hence does not apply.

5.1 OLS Estimation

Table 1 shows a simple regression with no controls in the first column. The next two columns are based on wage data from the LIS database, which does not include New Zealand, whereas the last two columns are based on wage data from Oostendorp (2012), which does not include Spain. I control for wage differences as suggested by Grogger and Hanson (2011) and for returns to skills, as suggested by Borjas (1987). The two sources for wage data with these two forms of considering wages lead to the four main specifications used throughout the paper, as introduced in table 1. Table 2 adds control variables to these specifications. Immigrant Opinion is always significant at either the 1% or 5% level, even with the more conservative critical values of the T-distribution and the two forms of clustering. In each case, a more positive attitude toward migrants leads to a higher skill ratio. The coefficients range from 5.1% to 10%. This means that a 1 percentage point increase in the fraction of respondents who have positive attitudes toward migrants leads to a 5%-10% increase in the ratio of the high skilled emigration rate to the low skilled emigration rate.

Table 1: Immigrant Attitudes and Skill ratios OLS

	(1)	(2)	(3)	(4)	(5)
	Skill ratio	Skill ratio	Skill ratio	Skill ratio	Skill ratio
Immigrant Opinion	0.080***	0.070***	0.081***	0.096***	0.071**
	(4.06)	(3.29)	(3.96)	(4.04)	(2.98)
	[2.13]*	[2.54]**	[2.21]*	[3.25]***	[2.23]**
LIS Wages		0.000052***			
		(5.49)			
LIS Returns			0.83		
			(1.33)		
Oostendorp Wages				0.0013**	
				(2.49)	
Oostendorp Returns					2.79**
					(2.26)
Constant	1.20***	-0.066	0.58	0.041	-0.12
	(4.35)	(-0.19)	(1.15)	(0.09)	(-0.21)
N	3469	3214	3214	3131	3131
adj. R^2	0.054	0.127	0.079	0.117	0.104
Nr. of clusters	12	11	11	11	11

t statistics, clustered by destination country, reported in parentheses (standard) and brackets (parametric)

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2: Immigrant Attitudes and Skill ratios OLS

	(1) Skill ratio	(2) Skill ratio	(3) Skill ratio	(4) Skill ratio
Immigrant Opinion	0.10***	0.097***	0.071***	0.051**
	(3.87)	(8.12)	(4.47)	(2.38)
	[3.66]***	[8.72]***	[3.14]**	[3.30]***
Asylee Share	11.7***	11.7***	-4.01*	2.00
	(3.24)	(16.98)	(-1.90)	(0.86)
GDP per capita	0.00030***	0.00019***	0.000030	0.00010**
	(3.55)	(15.79)	(0.99)	(3.00)
Total Migrants 1985	4.52	13.4***	22.7***	16.8***
	(0.74)	(4.99)	(5.34)	(3.21)
Anglophone Destination	-0.97***	-1.22***	0.28	0.29
	(-5.00)	(-14.86)	(0.44)	(0.30)
Social Expenditures	-0.0016***	-0.0015***	0.00024	-0.00019
	(-3.88)	(-21.81)	(1.04)	(-0.76)
Points	-0.47	-1.12**	-1.80***	-1.09**
	(-0.71)	(-3.09)	(-3.93)	(-2.36)
Family	-1.39	-4.09***	0.22	0.58
	(-0.62)	(-3.63)	(0.11)	(0.16)
LIS Wages	-0.000026			
	(-0.99)			
LIS Returns		1.62***		
		(12.70)		
Oostendorp Wages			0.0014***	
			(5.37)	
Oostendorp Returns				1.94*
				(2.17)
Constant	0.84	2.80***	-3.05***	-3.28*
	(0.72)	(5.00)	(-3.47)	(-2.22)
N	3214	3214	3131	3131
adj. R^2	0.173	0.184	0.181	0.177
Nr. of clusters	11	11	11	11

t statistics, clustered by destination country, reported in parentheses (standard) and brackets (parametric)
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

5.2 Instrumental Variables Estimation

The OLS regressions may suffer from endogeneity due to reverse causality. It may very well be that immigrants' skill composition influences attitudes toward migrants. However, it is unclear in which direction this bias goes and it may not lead to overestimated coefficients. Highly skilled immigrants may integrate better into society leading to more positive attitudes toward migrants. On the other hand, if the native population is

highly educated, they may be against highly skilled migrants, as they pose competition for them in the labor market. In that case, having more highly educated immigrants may lead to more negative attitudes. Mayda (2006) finds evidence for such economic considerations playing a role in attitude formation. She shows that GDP per capita is a good predictor of the skill composition of migrants relative to natives. Hence, this control variable should largely capture the economic channel of the reverse causality, namely the effect of migrant skills on attitudes through competition in the labor market. Nevertheless, there may still be the issue of reverse causality from non-economic effects[21] of migrant skills on attitudes toward migrants. On the other hand, however, Hansen and Legge (2017) find that racism is the quantitatively most important factor in individual concerns about immigration. Furthermore, they find that it approximately as important as economic and non-economic effects of migration combined. If attitudes toward migrants are truly driven by racism, then attitudes toward migrants would be independent of skills. In that case, we would not expect OLS estimates to exhibit much bias.

The median age of destination countries is used as an instrument. In several empirical specifications, Mayda (2006) finds that age can have a statistically significant negative influence on attitudes toward migrants. This is confirmed by the first stage regressions here, as age appears to be a sufficiently strong instrument.

For the instrument to solve the issue of reverse causality, we must accept that the median age in a destination country does not influence the skill ratio of migrants besides by affecting attitudes. One reason this may be violated, is if older countries tend to be less educated or offer higher wages for skilled labor. However, education differences between migrants and natives as well as wages are already controlled for. Migrants in general tend to be young[22] and possibly prefer younger populations for their host countries. Nevertheless, these considerations affect both low and highly skilled migrants equally. While highly educated migrants may migrate at a later age due to completing their tertiary education, this difference should should not make a very large difference for migrants above 25 years of age, as is the case for the sample. Moreover, tertiary education is typically already completed by the age of 25, so the youngest migrants in the sample for both skill levels should be of the same age. Furthermore, while there is literature on the effects of age at the source countries (see e.g. Zaiceva and Zimmermann (2014) for a discussion), I am unaware of any literature that identifies age in the destination country as a main factor in the migration decision in the first place. Moreover, I am also unaware of any literature that identifies different effects of median age in the destination country for the emigration rate of migrants with different skill levels. It is difficult to imagine highly skilled migrants choosing destination countries based on age in a manner that low skilled migrants do not, which gives reason to believe that the instrument is valid.

Table 3 shows the first stage regressions. As expected, age has a negative correlation with attitudes toward migrants and is highly significant. The t-statistics in the tables here are reported as for the OLS tables, with the parametrically corrected errors in square brackets below the errors that are typically obtained. In this case the parametric correction consistently offers higher standard errors. The F-statistics for the instrument (given by the squared t-statistic) range from 26 to over 282. Hence, the instrument is strong. The adjusted R^2 is relatively high. Hence, it is likely that endogeneity is being dealt with here, however, the high R^2 can also result because the variables in the first stage only vary across countries. The R^2, however, drops by

[21] Card et al. (2012) find evidence that such effects are quantitatively important.
[22] See Zaiceva and Zimmermann (2014).

10-25 when removing the instrument.

Table 4 reports the results of the second stage. These are similar to the OLS regressions, but the coefficients differ less across the four specifications, varying from 6.3% to 8.6%, which is reassuring. An increase of 1 percentage point in the fraction of respondents who have positive attitudes toward migrants leads to at least a 6% increase in the ratio of the high skilled emigration rate to the low skilled emigration rate. For regressions using LIS wage data the coefficients appear somewhat smaller compared to OLS, while the opposite is true for the Oostendorp case. These changes are unsurprising, as the direction of the reverse causality that the instrument addresses is unclear and measurement error is likely to be a concern. All coefficients are significant at the 1% level, except one. When using LIS wages, immigrant opinion is significant at 1% for the standard clustered errors estimator, but only significant at 10% for the parametrically corrected clustered errors. The overall picture seems to confirm the hypothesis that more positive attitudes toward migrants lead to better educated migrants.

5.2.1 Grouping Genders

In the previous regressions, I have used data for males and females seperately. This is a convenient way of obtaining more observations on migration decisions. However, it may be interesting to look at the data for both males and females together.

Another good reason to consider this case is the issue of zero migrant stocks, which cannot be easily tackled with the usual tools meant to deal with truncation. Hence, observations with zero stocks are reported as missing for the skill ratio. One way of addressing this problem[23] is to exclude countries with a large number of zero stocks altogether as a robustness check. Unfortunately, I cannot exclude any countries here and cluster standard errors, without dropping controls, as this would lead to more regressors than clusters. As I consider all the controls used to be important and since dropping all observations of a country, because some of its observations are missing may not be the best approach in my context of limited data, I do not employ a similar robustness check. Instead, by grouping observations for males and females, the share of zero migrant stocks goes down. This is because it is likelier for there to be zero stocks of migrants of a certain gender than for both males and females combined.

Table 5 reports the first stage, whereas table 6 shows the results of the second stage. The tables show the number of observations is reduced by less than half, meaning zero migrant stocks are less of an issue here. The results of the first stage hardly change and the instrument still appears to be strong. The second stage now shows slightly higher coefficients, ranging from 6,6% to 9%. The t-statistics are typically slightly lower, but significance levels remain the same, except for the parametrically corrected standard error when using Oostendorp returns, which is now significant at 5% instead of at 1%. However, the t-statistic is very close to the threshold for significance at 1%, which is 3.169. Again, the data seems to confirm the hypothesis.

[23] Pursued by Grogger and Hanson (2011).

Table 3: First Stage Regression

	(1) Immigrant Opinion	(2) Immigrant Opinion	(3) Immigrant Opinion	(4) Immigrant Opinion
Age	-2.27***	-2.46***	-3.10***	-3.36***
	(-16.80)	(-7.50)	(-15.16)	(-11.57)
	[-6.80]***	[-6.08]***	[-10.43]***	[-5.10]***
Asylee Share	4.26	31.0*	176.8***	117.9***
	(0.29)	(2.03)	(9.90)	(3.40)
GDP per capita	-0.00080**	-0.00017	0.0017***	0.00098*
	(-2.41)	(-0.73)	(7.94)	(2.17)
Total Migrants 1985	-157.3***	-171.7***	-218.4***	-188.1***
	(-4.99)	(-3.98)	(-6.98)	(-3.27)
Anglophone Destination	2.52**	2.98	28.2***	34.8**
	(2.31)	(1.72)	(6.74)	(3.08)
Social Expenditures	0.0036*	0.00069	-0.0049***	0.00069
	(2.20)	(0.50)	(-3.29)	(0.30)
Points	23.3***	23.8***	22.4***	18.6***
	(8.10)	(5.48)	(7.12)	(3.37)
Family	36.1***	39.2**	-73.4***	-93.8*
	(3.41)	(2.43)	(-5.14)	(-2.10)
LIS Wages	0.00029**			
	(3.03)			
LIS Returns		2.48		
		(0.96)		
Oostendorp Wages			-0.018***	
			(-9.02)	
Oostendorp Returns				-33.4**
				(-2.87)
Constant	71.4***	76.3***	113.3***	128.5***
	(11.16)	(5.14)	(12.25)	(6.50)
N	3214	3214	3131	3131
adj. R^2	0.965	0.945	0.977	0.909
Nr. of clusters	11	11	11	11

t statistics, clustered by destination country, reported in parentheses (standard) and brackets (parametric)

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Immigrant Attitudes and Skill ratios TSLS

	(1) Skill ratio	(2) Skill ratio	(3) Skill ratio	(4) Skill ratio
Immigrant Opinion	0.063***	0.081***	0.086***	0.086***
	(4.97)	(9.01)	(7.95)	(8.41)
	[1.96]*	[6.71]***	[5.29]***	[3.63]***
Asylee Share	9.97***	11.4***	-5.27**	2.05
	(3.19)	(12.57)	(-2.05)	(0.64)
GDP per capita	0.00025***	0.00019***	0.000015	0.00010**
	(3.70)	(11.56)	(0.41)	(2.19)
Total Migrants 1985	0.90	11.3***	25.1***	18.7***
	(0.12)	(3.64)	(5.03)	(3.08)
Anglophone Destination	-0.82***	-1.13***	0.060	-0.070
	(-3.25)	(-9.07)	(0.10)	(-0.07)
Social Expenditures	-0.0013***	-0.0014***	0.00030	-0.00028
	(-4.01)	(-14.86)	(1.21)	(-1.05)
Points	0.28	-0.78**	-2.12***	-1.51**
	(0.37)	(-2.22)	(-3.90)	(-2.42)
Family	0.0029	-3.32***	0.48	-0.072
	(0.00)	(-2.91)	(0.23)	(-0.02)
LIS Wages	-0.000011			
	(-0.57)			
LIS Returns		1.59***		
		(9.37)		
Oostendorp Wages			0.0016***	
			(4.92)	
Oostendorp Returns				2.03*
				(1.80)
Constant	0.47	2.51***	-3.06***	-2.61*
	(0.39)	(4.22)	(-3.83)	(-1.79)
N	3214	3214	3131	3131
adj. R^2	0.171	0.183	0.180	0.174
Nr. of clusters	11	11	11	11

t statistics, clustered by destination country, reported in parentheses (standard) and brackets (parametric)
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: First Stage Regression - Grouped Genders

	(1) Immigrant Opinion	(2) Immigrant Opinion	(3) Immigrant Opinion	(4) Immigrant Opinion
Age	-2.27***	-2.46***	-3.10***	-3.36***
	(-16.53)	(-7.45)	(-15.19)	(-11.52)
	[-6.82]***	[-6.06]***	[-10.44]***	[-5.10]***
Asylee Share	4.34	31.5*	177.0***	119.7***
	(0.29)	(2.04)	(9.95)	(3.47)
GDP per capita	-0.00081**	-0.00017	0.0017***	0.0010**
	(-2.37)	(-0.71)	(8.00)	(2.26)
Total Migrants 1985	-156.5***	-172.0***	-219.1***	-191.3***
	(-4.92)	(-3.97)	(-7.00)	(-3.29)
Anglophone Destination	2.51**	2.98	28.2***	35.1**
	(2.27)	(1.70)	(6.62)	(3.06)
Social Expenditures	0.0036*	0.00066	-0.0049***	0.00055
	(2.16)	(0.47)	(-3.29)	(0.24)
Points	23.2***	23.8***	22.4***	18.8***
	(8.01)	(5.45)	(7.12)	(3.37)
Family	36.7***	39.8**	-73.6***	-95.4*
	(3.50)	(2.42)	(-5.06)	(-2.13)
LIS Wages	0.00029**			
	(2.98)			
LIS Returns		2.45		
		(0.96)		
Oostendorp Wages			-0.018***	
			(-9.11)	
Oostendorp Returns				-33.9**
				(-2.97)
Constant	71.2***	76.0***	113.4***	129.5***
	(11.01)	(5.06)	(12.29)	(6.62)
N	1680	1680	1644	1644
adj. R^2	0.965	0.944	0.977	0.908
Nr. of clusters	11	11	11	11

t statistics, clustered by destination country, reported in parentheses (standard) and brackets (parametric)

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Immigrant Attitudes and Skill ratios TSLS - Grouped Genders

	(1) Skill ratio	(2) Skill ratio	(3) Skill ratio	(4) Skill ratio
Immigrant Opinion	0.066***	0.085***	0.090***	0.089***
	(4.61)	(9.74)	(6.69)	(7.02)
	[1.92]*	[5.46]***	[4.58]***	[3.16]**
Asylee Share	10.9***	12.3***	-8.16***	0.71
	(3.05)	(13.61)	(-2.58)	(0.18)
GDP per capita	0.00027***	0.00019***	-0.000028	0.000080
	(3.52)	(11.81)	(-0.65)	(1.39)
Total Migrants 1985	2.28	14.4***	30.2***	22.5***
	(0.27)	(4.76)	(4.89)	(2.99)
Anglophone Destination	-0.87***	-1.24***	-0.045	-0.23
	(-3.06)	(-10.06)	(-0.06)	(-0.18)
Social Expenditures	-0.0014***	-0.0015***	0.00057*	-0.00014
	(-3.73)	(-15.66)	(1.83)	(-0.42)
Points	0.14	-1.06***	-2.54***	-1.80**
	(0.17)	(-3.14)	(-3.77)	(-2.31)
Family	0.53	-3.51***	1.85	1.35
	(0.22)	(-3.10)	(0.71)	(0.25)
LIS Wages	-0.000017			
	(-0.81)			
LIS Returns		1.84***		
		(11.22)		
Oostendorp Wages			0.0020***	
			(4.98)	
Oostendorp Returns				2.56*
				(1.90)
Constant	0.0025	2.51***	-4.08***	-3.62**
	(0.00)	(4.23)	(-4.19)	(-2.07)
N	1680	1680	1644	1644
adj. R^2	0.180	0.197	0.186	0.176
Nr. of clusters	11	11	11	11

t statistics, clustered by destination country, reported in parentheses (standard) and brackets (parametric)
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

6 Conclusion

This paper is one of the first to address the effects of attitudes toward migrants on the skill composition of immigrants in destination countries. This can have important policy implications, as countries increasingly attempt to attract highly skilled migrants. The paper hopes to contribute to further examination of this

relationship by being one of the first to pose this hypothesis explicitly and to offer a theoretical framework as well as some empirical evidence on the link between migrant skill levels and attitudes toward migrants.

I have presented a simple theoretical model showing that general anti-immigrant sentiment reduces the average skill composition of migrants. The intuition for the result is that the highly skilled are more mobile and have better outside options. Furthermore, if fixed migration costs depend on skill transferability across countries, then migrants become more sensitive to negative attitudes. We may expect skill transferability to increase over time due to globalism, which means migrants might become even more sensitive to negative atttitudes in the future.

The paper also finds empirical support for the hypothesis. Using survey data on attitudes toward migrants and bilateral migrant stock data, the regressions show a significant and positive effect of positive attitudes. The potential reverse causality was addressed by using median age in the host countries as an instrumental variable. I find that an increase of 1 percentage point in the fraction of natives who have positive attitudes toward migrants leads to at least a 6% increase in the ratio of the high to low skilled emigration rate.

One implication of the paper would be that supporting anti-immigrant sentiment may be counterproductive for policymakers seeking to reduce low skilled and attract only highly skilled migrants. Another policy implication is that strategies aiming to attract the highly skilled should also involve improving attitudes toward immigrants. In this sense, the paper provides potentially new policy implications of the large literature on the determinants of immigration preferences.

A possible avenue for future research could be potential implications for immigrant integration, where vicious cycles may appear. If the native populace is unhappy with their immigrant population for whatever reasons, I have shown that this can lead to a pool of even less skilled immigrants, with the lowest skilled remaining. This in turn can lead to natives having an even lower opinion of migrants. The low-skilled migrant population may feel unwelcome and therefore neither integrates, nor leaves. This may imply a negative spiral as well as mutual animosity between natives and immigrants.

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8 Appendix A. Data Descriptions

A1. Wage measures

For the LIS data I use waves 3 and 4, but only for surveys that did not occur after 1995. The database type is person file. I take 20th and 80th percentiles of the annual wage distribution for destination countries. Each year specific percentile for each country is then converted to 2011 PPP international US dollars using the conversion tables provided by the LIS. I then take averages over these percentiles for each country. Following Grogger and Hanson (2011) I only use data from the LIS on male household heads between 25 and 64 who have worked at least 30 hours a week and in the last year at least 39 weeks. I additionally exclude observations with a zero or missing wage, as this is impossible for workers. For the Oostendorp (2012) data, I take the time period from 1985 to 1995 and average the percentiles for each year and country. I take his monthly wage data with country-specific calibration (type 3) with uniform weighting.

A2. Migration Policy

For the asylum seeker data, I attempt to always use the newest possible data. The most recent publication from the OECD containing data for 1995 is from the International Migration Outlook 2006 (OECD 2006). For the earlier years I use the OECD's Trends in International Migration (OECD 2005, 2004, 2003, 2001a, 2001b), which was discontinued in 2006. Each report typically has data going back ten years prior to publication, so the most recent report containing data on 1990 is OECD (2001b). For each subsequent year, I use the most recent data available, which is usually the subsequent report.