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Abstract

This paper explores potential explanations behind the educational gap between young natives and immigrants using two measures, negative attitudes towards immigrants and networking, which may influence natives and immigrants differently. The paper considers, both theoretically and empirically, the impact of negative attitudes and networking taking into account that these parameters may influence high and uneducated workers as well as immigrants and natives differently, creating different incentives to acquire education for the two ethnic groups. Using rich Danish administrative data, this paper finds evidence that greater negative attitudes increase incentives for males to acquire education and that networking also increases immigrant education.

1 Introduction

An OECD report from 2006 reveals that immigrant and immigrant offspring at a very young age express equal or sometimes even higher motivation to learn mathematics than their native counterparts and very positive attitudes towards school and education in general.[1] However, at the age of 15, they under perform compared to the natives. More than a third of the first and second generation immigrant children in Austria, Belgium, Denmark, Germany, Norway and the USA, who have spent all their entire schooling in the host country, perform below the baseline PISA benchmark for mathematics performance, a period at which students begin to demonstrate the kind of skills that enable them to actively use mathematics.[2] Furthermore, when taking their parental background into account, immigrants tend not to perform as well in school as their native peers.[3] This fact may then, in turn, influence their choice of further education, and eventually their labour market outcome and performance.

When explaining the educational gap between immigrants and natives, measures which influence immigrants and natives differently are important. The aim of this paper is to discover the factors that shift the motivation and performance of immigrants when the decision about education beyond compulsory school is taken. For the educational decision, workers compare the value corresponding to acquiring education to the value of not acquiring education. These values depend on the expected incomes which are influenced by both the employment probability as well as wages. The novelty of this paper is to examine theoretically, as well as empirically, whether negative attitudes towards immigrants and networking could influence immigrant employment chances, as well as immigrant wages differently for educated workers and uneducated workers compared to the same variables for

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[1]OECD 2006
[2]ibid.
[3]Nielsen and Rangvid 2012

natives. In this case, the value of acquiring education may be impacted differently for natives and immigrants and as such, may explain the educational gap between natives and immigrants.

In particular, we will examine the effect of negative attitudes towards immigrants in a region and potential impact of networking through individuals of an individual's own ethnicity living in a region. Negative attitudes towards immigrants may cause discrimination, implying that workers are fired or decide to quit a job. This lowers the value of employment, through both shorter employment periods and lower wages, as the bargaining power of immigrants falls which in turn affects the value of acquiring education.

There are only a few empirical papers on discrimination and employment and wages (see for example Waisman and Larsen 2015, Kofi Charles and Guryan 2008) but, to our knowledge, no papers on the additional impact through these channels on education. Concerning networking, immigrants from the immigrant's home country or region may increase the likelihood of getting a job and improve labour market performance. Hence, more well-educated immigrants from the immigrant's home country or region may increase the return of education, implying that more immigrants acquire education. This may work in different ways. Social networks may influence employment outcomes: the more employed contacts the individual has, the more likely it is that the individual will learn about new job openings (Calvo-Armengol and Jackson 2004, Hellerstein et al 2009) and networks may influence both wages and employment opportunities (Fontaine 2007, Galeanios 2014, Damm 2014). Similarly, empirical research confirms that (see for example Andersson et al 2009, Solignac and Tô 2015) more immigrants living in areas with a large number of employed neighbours are more likely to have jobs than immigrants living in areas with fewer employed neighbours. This could be due to networking and/or social norm effects. Furthermore, Kramarz and Skans (2014) show for Swedish data that family network are important, in terms of obtaining the first job after graduation, and that this impact is stronger for youth of uneducated parents and immigrants inhabited in regions with high unemployment. Hence, networking may increase employment probability, and more networking among immigrants may, to some extent, offset the decrease in employment perspectives and wage modifications due to negative attitudes or discrimination.

We formulate a Becker-style taste discrimination model within a search and wage bargaining setting. Bowlus and Eckstein (2002), Flabbi (2010), Mailath et al. (2000), and Lang et al. (2005) study discrimination in the presence of search frictions but with no educational decision. We assume that potential negative tastes towards immigrants imply that their separation rate from the job is higher than the separation rate of a native worker. This may be due to both the worker deciding to quit and the employer firing the worker. This assumption allows us to assume that neither job searchers nor employers know whether discrimination will take place in a particular firm; all that is known is that immigrants face a higher separation rate than natives. We show that immigrants' potential higher separation rate, ceteris paribus, also implies that their employment chances fall as firms, in turn, supply fewer vacancies. Natives and immigrants decide whether to educate or not. They are aware of the existence of discrimination in the labour market and of the possibility of influencing their chances of getting employed through networking. In terms of negative attitudes towards immigrants, we consider two different cases. In the first case, all immigrant workers are affected by negative attitudes towards them and in the second, only low-educated workers are affected. The channel through which the educational level is affected by networking and negative attitudes in our model is through the impact on the expected employment perspectives. However, the possibility that negative attitudes also influence the value of being unemployed also directly, that is, over and above the impact on wages and employment chances, could easily be included in the theoretical model and is consistent with the empirical analysis which we perform. We conduct the empirical analysis on Danish Data due to the excellent quality of the Danish Register Data: we have the whole population, can link to family members, and have information on employment, education, income, etc.

The paper is structured as follows. In section 2 the model is setup, then the following sections consider the impact of negative attitudes towards immigrants and the fraction of immigrants. In Section 6 we consider heterogenous networking effects. Sections 7 and 8 provide a macro-econometric and a micro-econometric analysis. Section 9 explores the robustness of the micro-econometric results, and Section 10 concludes.

2 The Model

We consider a search and matching model with natives, N and immigrants, I, which may be educated with productivity y^h or noneducated with productivity, y^l where $y^h > y^l$. The workers search for jobs and firms search for workers and the labour force is normalised at one. For simplicity, we assume that firms may supply vacancies directed towards natives or immigrants. We then include the two features, which may differ for immigrants and natives, influencing their labour market performance differently and thereby their educational decision - namely negative attitudes towards immigrants and networking effects. [4]

Immigrants may be harmed by negative attitudes towards them at their workplace, resulting in separation from the job. The reason may be many-fold: negative attitudes against immigrants may imply that a firm needs to deal with unexpected issues in the firm or with clients, and/or the immigrant voluntary quits. Hence, immigrants face a random negative shock. We therefore assume that the separation rate, s_i^m, $m = h, l$, $i = N, I$, may be increasing in negative attitudes towards immigrants, a^m, $m = h, l$, giving, $s_I^m = s_N (1 + a^m)$ where $s_N^h = s_N^l = s_N$. Negative attitudes may (among other things) themselves be influenced by the fraction of immigrants in an area, an issue we will return to below.

On the other hand, more immigrants may make it easier to obtain employment through networking. We here follow Fontaine (2007) by assuming that networking, $\lambda_i^m, i = N, I,\ m = h, l$ is increasing in the number of people of the same origin as the individual. We assume that $\lambda_I^h = t^h \frac{I(1-\hat{e_I})}{(N+I)(1-\hat{e_I})} = t^h I$, $\lambda_N^h = t^h \frac{N(1-\hat{e_N})}{(N+I)(1-\hat{e_N})} = t^h N = t^h (1 - I)$, $\lambda_I^l = t^l \frac{I\hat{e_I}}{(N+I)\hat{e_I}} = t^l I$ and $\lambda_N^l = t^l \frac{N\hat{e_N}}{(N+I)\hat{e_N}} = t^l N = t^l (1 - I)$ as $N + I = 1$, where $0 < t^m < 1,\ m = h, l$, and $\hat{e}_i$, $i = N, I$ is the number of low-educated people and $1 - \hat{e}_i$, $i = N, I$, is the number of educated workers. One may argue that a very large number of own ethnicity may not be as important as a relative smaller number, a potential network may grow so big that it is not really a usually network in terms of employment perspectives. This could be included in the analysis by changing the functional form of the network variable, so that it is increasing in the number the worker's own nationality but at a decreasing rate. We will return to this issue below.

2.1 Matching

We assume that firms advertise $V_i^m, i = N, I,\ m = h, l$ vacancies. Unemployment rates are given by $u_i^m, i = N, I,\ m = h, l$ and there are $L_i^m, i = N, I,\ m = h, l$ employees. Labour market tightness by the ethnic group is given by $\theta_i^m = (V_i^m + \lambda_i^m L_i^m)/u_i^m$, where the transition rate for an unemployed worker is given by $f(\theta_i^m)$ and for the firm it is $q(\theta_i^m)$. We assume that the worker transition rate is increasing in labour market tightness and at a decreasing rate, $\partial (f(\theta_i^m)) / \partial \theta_i^m > 0, \partial^2 (f(\theta_i^m)) / (\partial \theta_i^m)^2 < 0$ and the firm's transition rate is decreasing in labour market tightness at a decreasing rate, $\partial (q(\theta_i^m)) / \partial \theta_i^m < 0$ and $\partial^2 (q(\theta_i^m)) / (\partial \theta_i^m)^2 > 0$.

2.2 The Firm

The firm chooses the number of vacancies so as to maximise profits subject to negative attitudes towards immigrants and subject to networking effects. We assume, for simplicity, that firms can direct their search towards natives or immigrants and that each worker produces y^m, $m = h, l$ and receives the bargained wage, $w_i^m, i = N, I,\ m = h, l$. We denote the discount rate by ρ and hiring costs are increasing in productivity, ky^m, $m = h, l$. A firm chooses the number of vacancies to advertise, $V_i^m, i = N, I,\ m = h, l$ and takes into account that its employees also produce applicants through networking. Each firm hiring natives or immigrants solves the following Bellman equation:

$$\rho \Pi_i(L_i^m) = max((y^m L_i^m - w_i^m - ky^m V_i^m + \Pi_i(L_i^m)), i = N, I,\ m = h, l, \qquad s.t. \tag{1}$$

[4] In Larsen and Waisman 2012, it is assumed that it is not possible for firms to direct their search to either immigrants or natives. Therefore, any negative impact on immigrants, will through changed vacancy supply also affect natives. As the present paper also include educational choice and networking we, for simplicity, keep this additional channel out of the present set-up.

$$\dot{L}_N^m = (\lambda_N^m L^m + V_N^m) q(\theta_N^m) - s_N L_N^m,\ m = h, l, \tag{2}$$

$$\dot{L}_I^m = (\lambda_I^m L^m + V_I^m) q(\theta_I^m) - s_I^m L_I^m,\ m = h, l. \tag{3}$$

Firms choose their optimal number of employees, using two methods of search: advertising by the firm or networking, which happens at the rate $\lambda_i^m L_j^m f(\theta_i^m)$, $i = N, I$. Separation rates for immigrants, $s_I^m = s_N (1 + a^m) \geq s_N$, which are dependents of negative attitudes, a^m, $m = h, l$ may differ for low productivity and high productivity workers. Hence, matches between immigrants and the firm may be dissolved more often than matches involving natives and also may differ for high- and low-educated workers, implying that, for given networking, the expected profitability of a firm employing natives may be different than the expected profitability of employing an high and/or uneducated immigrant.

With identical firms, using equations (1)-(3) and Kuhn-Tucker conditions, we obtain the non-trivial solution in the steady state determining labour market tightness, θ_i^m, $i = N, I$,$m = h, l$:

$$\frac{ky^m}{q(\theta_N^m)} = \frac{y^m - w_N^m}{\rho + s_N - \lambda_N^m q(\theta_N^m)}, \frac{ky^m}{q(\theta_I^m)} = \frac{y^m - w_I^m}{\rho + s_N(1 + a^m) - \lambda_I^m q(\theta_I^m)}. \tag{4}$$

The partial equilibrium results are the following. More severe negative attitudes, a higher a^m, will tend to reduce labour market tightness and more networking, a higher λ_i^m, will raise labour market tightness for the firm hiring the specific type, either immigrants or natives.

2.3 The Worker

Let U_i^m be the value of being an unemployed worker and $E_i^m, m = h, l,\ i = N, I$ be the value of an employed worker. The values are determined by

$$\rho U_i^m = f(\theta_i^m)(E_i^m - U_i^m) - \Gamma(m)\, c(e_i), i = N, I,\ m = h, l, \tag{5}$$

$$\rho E_I^m = w_I^m + s_I^m (U_I^m - E_I^m) - \Gamma(m)\, c(e_i), m = h, l \tag{6}$$

$$\rho E_N^m = w_N^m + s_N (U_N^m - E_N^m) - \Gamma(m)\, c(e_i), m = h, l. \tag{7}$$

We assume that workers have different abilities, e_i, and therefore different costs of obtaining education, $c(e_i)$. The variable e_i is uniformly distributed, $e_i \in [0, 1]$ where educational costs are decreasing in ability at a decreasing rate, $c'(e_i) < 0, c''(e_i) > 0$. In order to guarantee a non-trivial solution where some, but not all, individuals choose to acquire education, the individual with the highest ability faces a very low cost of education, $c(1) = 0$, and the individual with the lowest ability level face very high costs of education, i.e. $lim_{e_i \to 0} c(e_i) = \infty$. $\Gamma(m), m = h, l$, is an indicator function, taking the value zero if the worker does not acquire education and one, if the worker acquires education. Hence, $\Gamma(h) = 1$ and $\Gamma(l) = 0$.[5]

2.4 Wages

We assume that wages are determined by Nash bargaining and that the bargaining power is a half, so that $X_i^m = E_i^m - U_i^m$, $i = N, I$, $m = h, l$, where from equation (4) we have that $X_i^m = \frac{ky^m}{q(\theta_i^m)} = \frac{y^m - w_i^m}{\rho + s_i - \lambda_i^m q(\theta_i^m)}$. We assume that the hiring cost parameter, k, is equal across firms, but that productivity and therefore actual

[5]We assume that the educational cost is a cost to acquire and maintain education or skills. This is a simplifying assumption and is not important for the results. The assumption enables us to use a model without having workers continuously being born and dying. Such a model would deliver similar qualitative expressions.

hiring costs are higher for firms employing educated workers. This gives that $ky^m = X_i^m q(\theta_i^m)$ and thereby

$$X_i^m = \frac{y^m - w_i^m + \lambda_i^m k y^m}{(\rho + s_i^m)},\ m = h, l. \tag{8}$$

Subtracting equation (5) from equation (6) or (7) and then using $X_i^m = E_i^m - U_i^m$ and (8) give

$$0.5 \cdot y^m \left(1 + (\lambda_N^m + \theta_N^m)\, k\right) = w_N^m, \tag{9}$$

$$0.5 \cdot y^m \left(1 + (\lambda_I^m + \theta_I^m)\, k\right) = w_I^m. \tag{10}$$

We note that wages are increasing in labour market tightness, networking and productivity. Substituting for wages into the equation determining labour market tightness, we obtain the equations for labour market tightness (8) as a function of parameter values and independently of productivity as hiring costs are a function of productivity:

$$k(\rho + s_I^m)2 = (1 - \theta_I^m k + \lambda_I^m k)\, q(\theta_I^m), \tag{11}$$

$$k(\rho + s_N)2 = (1 - \theta_N^m k + \lambda_N^m k)\, q(\theta_N^m). \tag{12}$$

We note the following. Regarding relative separation rates we have that, if $s_I^m > s_N$, then the left hand side of (11) is larger than the left hand side of (12) tending to reduce labour market tightness for firms employing immigrants and thereby the transition rate for immigrants. Considering networking, labour market tightness is increasing in labour networking: $\frac{d\theta_i^m}{d\lambda_i^m} = \frac{kq(\theta_i^m)}{D_i^m} > 0$, $i = N, I$, $m = h, l$, where $D_i^m = -\left((1 - \theta_i^m k + \lambda_i^m k)\, q'(\theta_i^m) - \theta_i^m k q(\theta_i^m)\right) > 0$. If networking is higher for immigrants than natives, $\lambda_I^m > \lambda_N^m$, this tends to increase θ_I^m relatively to θ_N^m. However, if $s_I^m > s_N$ this tends to increase θ_N^m relatively to θ_I^m. Therefore, if $s_I^m > s_N$ and $\lambda_I^m \leq \lambda_N^m$ then $\theta_I^m < \theta_N^m$, whereas the relative size is ambiguous if $\lambda_I^m > \lambda_N^m$.

For the rest of the theoretical analysis we assume that educated and uneducated workers face the same networking effect, hence $\lambda_i^h = \lambda_i^l = \lambda_i$, $i = N, I$. With this assumption we obtain that labour market tightness is the same for high and low-educated natives, $\theta_N^h = \theta_N^l = \theta_N$ whereas we have two scenarios for immigrants. In the first case, negative attitudes is present for both high and low productivity workers and hence $s_I^h = s_I^l = s_I$ resulting in $\theta_I^h = \theta_I^l = \theta_I$. In the second case, negative attitudes exist for educated workers only and hence $s_N = s_I^h < s_I^l$ resulting in $\theta_I^h > \theta_I^l$. This assumption allows us to consider the impact of a change in attitudes and immigration on labour market tightness, education and unemployment, without making any assumptions about the relative importance of networking for educated or uneducated workers. We will in Section 6 below discuss how the results are modified in the case of heterogeneous networking effects. We have the following result.

Result: In case 1, where negative attitudes are present in both the high and low productivity sector, $a^h = a^l > 0$, and networking associated with natives is larger than or equal to networking associated with immigrants, $\lambda_N \geqq \lambda_I$ then labour market tightness for natives is higher than labour market tightness for immigrants, $\theta_N > \theta_I$, and natives' wages are thus higher than immigrants' wages, $w_N^m > w_I^m$. In case 2, when negative attitudes are present in the low productivity sector only, $a^h = 0$, $a^l > 0$, and networking associated with natives is larger than or equal to networking associated with immigrants, $\lambda_N \geqq \lambda_I$, then for low productivity workers, labour market tightness for natives is higher than labour market tightness facing immigrants, $\theta_N^l > \theta_I^l$, and low productivity natives' wages are thus higher than wages for low productivity immigrants, $w_N^l > w_I^l$ whereas for high productivity workers, $\theta_N^h = \theta_I^h$ and $w_N^h = w_I^h$. When $\lambda_N < \lambda_I$, then the relative sizes of labour market tightness and immigrants, θ_N^m and θ_I^m, and wages, w_N^m and w_I^m, are indeterminate.

Notice that given the assumption above that $\lambda_I = tI$ and $\lambda_N = t\,(1 - I)$, where $0 < t < 1$ we have that $\lambda_N > \lambda_I$ given $1/2 > I$, which is the most realistic case. In case the networking function takes another form, namely if it is increasing in the number of the worker's own ethnicity but at a decreasing rate, for example,

$\lambda_I = tI^{1/2}$ and $\lambda_N = t(1-I)^{1/2}$, we will still have that $\lambda_N > \lambda_I$ as long as $1/2 > I$, but the impact of an additional labour force participant is larger for immigrants than natives as long as immigrants are the minority.

2.5 Education

When individuals decide on whether to educate or not, they compare the value of acquiring education to the value of remaining uneducated. That is, at each point in time, as an unemployed worker, they compare the value of being unemployed as a educated worker to the value of being unemployed as an uneducated worker. Workers with high educational costs find it too costly to obtain education, whereas high ability workers and low educational costs individuals find it more than worthwhile to do so. The marginal worker has the ability level, $\hat{e_i}, i = N, I$, which makes the worker just indifferent between acquiring education or remaining uneducated. For simplicity, we assume that natives and immigrants are identical with respect to the distribution of educational costs. We write the condition determining the educational costs of the marginal worker as

$$\rho U_i^h(\hat{e_i}) = \rho U_i^l,\ i = N, I. \tag{13}$$

The higher $\hat{e_i}$ is, the higher is the ability level of the marginal worker acquiring education. Hence, fewer workers acquire education, and a smaller fraction of the workers will be educated. Use equations (5)-(7) and (13), the bargaining condition together with the free entry condition, to obtain the following simplified condition in the first case where $a^h = a^l$ for immigrants and $a = 0$ for natives:

$$\left(y^h - y^l\right)\theta_i k = c(\hat{e_i}), i = N, I. \tag{14}$$

Equation (14) gives $\hat{e_i}, i = N, I$ as a function of the endogenous variables, $\theta_i, i = N, I$. The higher the productivity difference is, the higher are wage differences, and then the more people will acquire higher education. For equal networking rate, labour market tightness facing natives is higher than labour market tightness facing immigrants, which results in that natives acquire more education than immigrants, that is, $\hat{e}_I > \hat{e}_N$.

In the second case, the result changes for immigrants whereas the natives' educational decision is still given by equation (14), i.e. when $a^h = 0$ and $a^l > 0$ then we obtain:

$$\left(y^h\theta_I^h - y^l\theta_I^l\right)k = c(\hat{e_I}). \tag{15}$$

In this case, with equal networking rate for all workers, we now obtain that $\hat{e}_N > \hat{e}_I$ as low productivity immigrants are worse of than natives in terms of a lower transition rate into a job, $\theta_I^l < \theta_N^l$ and lower wages and high productivity immigrants have the same wages and employment probability as natives, $\theta_I^h = \theta_N^h$. Hence, due to that the uneducated immigrants are relative worse of than natives, immigrants in this case experience stronger incentives for acquiring education that natives. This is summarised in the following result.

Result: In case 1, where negative attitudes are present in both the high and low productivity sector, $a^h = a^l > 0$, and networking associated with natives is equal to networking associated with immigrants, $\lambda_N = \lambda_I$, natives acquire more education than immigrants, that is, $\hat{e}_I > \hat{e}_N$. *In case 2, where negative attitudes is present in the low productivity sector only, $a^h = 0$, $a^l > 0$, and networking associated with natives is equal to networking associated with immigrants, $\lambda_N = \lambda_I$, then immigrants acquire more education than natives $\hat{e}_I < \hat{e}_N$.*

Notice here the significance of the networking assumption. In section 6 below we discuss the impact of including heterogeneity and we discussed the nonproportionality of the networking function above.

2.6 Unemployment

In equilibrium, inflows are equal to outflows. The equilibrium flows characterising the labour market for workers are then, $f(\theta_i^m)\mu_i^m = s_i^m n_i^m, i = N, I,\ m = h, l$, and $n_i^h + \mu_i^h = (1 - \hat{e}_i)i,\ i = N, I,\ n_i^l + \mu_i^l = \hat{e}_i i,\ i = N, I$, where $n_i^m,\ i = N, I,\ m = h, l$, is employment, and $\mu_i^m, i = N, I,\ m = h, l$, is unemployment. The labour force is

normalised at one, $N+I=1$, giving the following expression for natives' unemployment rates, u_N^m, $m=h,l$: $u_N^h=u_N^l=u_N=s_N/\left(f\left(\theta_N\right)+s_N\right)$, as $\theta_N^h=\theta_N^l$. For immigrants we have in the first case, $s_I^h=s_I^l$ and hence $\theta_i^h=\theta_i^l$ the following unemployment rates:

$$u_i^h=u_i^l=u_i=\frac{s_i}{f\left(\theta_i\right)+s_i},\ i=N,I. \tag{16}$$

Unemployment rates for educated workers are equal to unemployment rates of uneducated workers. This results stems from the assumption that hiring costs are proportional to productivity. In the second case, where $s_I^h<s_I^l$ as $a^h=0$ and $a^l>0$ then $s_I^l=s_N(1+a^l)>s_I^h=s_N$ and therefore$f\left(\theta_I^l\right)<f\left(\theta_I^h\right)=f\left(\theta_N\right)$ which results in the following unemployment rates

$$u_N=u_I^h<u_I^l=\frac{s_I}{f\left(\theta_I^l\right)+s_I},\ i=N,I. \tag{17}$$

The result is the following.

Result: When networking associated with natives is larger than or equal to networking associated with immigrants, $\lambda_N\geq\lambda_I$ and in the presence of negative attitudes for both high productivity and low productivity immigrants, $a^h=a^l>0$, the unemployment rate of natives is smaller than the immigrants' unemployment rate, $u_N<u_I$ and when only uneducated workers face negative attitudes, $a^l>a^l=0$, then $u_I^l>u_I^h=u_N$. When $\lambda_N<\lambda_I$ then the relative sizes of the unemployment rates facing natives and immigrants, u_N and u_I are indeterminate.

3 Negative Attitudes

In this section, we examine what happens to labour market tightness, wages, education and unemployment when immigrants face more severe negative attitudes. For simplicity, we consider the case where $\lambda_N=\lambda_I$. The impact on labour market tightness, wages and unemployment as well as education will differ dependent on whether negative attitudes towards immigrants exists in both sectors or in the low productivity sector only. We have the following proposition.

Proposition: In the presence of negative attitudes for both high productivity and low productivity immigrants, $a^h=a^l>0$, then when negative attitudes increase, labour market tightness facing immigrants falls, causing their wages to fall and their unemployment rate to increase. Lower labour market tightness reduces education of immigrants. When only low productivity workers face negative attitudes, $a^l>a^h=0$, then labour market tightness and wages for low productivity immigrants falls and their unemployment rate increases whereas high productivity immigrants are not affected, which increases education for immigrants. There is no impact on natives.

Proof: *First case: Differentiating equations (11), (12), (10) and (9) with respect to $a^h=a^l=a$ shows that there is a negative impact on labour market tightness and wages facing immigrants but no impact for natives* $\frac{d\theta_I}{da}=\frac{-k2}{D_I}\frac{ds_I}{da}<0$, $\frac{d\theta_N}{da}=0$, $\frac{dw_I^m}{da}=0.5y^m\frac{d\theta_I}{da}k<0$, $\frac{dw_N}{da}=0$. *Concerning unemployment and education, we differentiate equations (16) and (14) with respect to a to obtain:* $\frac{du_I}{da}=\frac{-s_If'(\theta_I)}{(f(\theta_I)+s_I)^2}\frac{d\theta_I}{da}>0$, $\frac{du_N}{da}=0$, $\frac{d\hat{e}_I}{da}=\frac{\left(y^h-y^l\right)\frac{d\theta_I}{da}}{c'(\hat{e}_I)}>0$, $\frac{d\hat{e}_N}{da}=0$.

In the second case, the results for immigrants change to $\frac{d\theta_I^l}{da^l}=\frac{-k2}{D_I^l}\frac{ds_I^l}{da^l}<0$, $\frac{d\theta_I^h}{da^l}=0$, $\frac{dw_I^l}{da^l}=0.5y^m\frac{d\theta_I^l}{da^l}k<0$, $\frac{dw_I^h}{da^l}=\frac{dw_N}{da^l}=0$. *Next, we differentiate equation (17) and (15) to obtain* $\frac{du_I^l}{da^l}=\frac{-s_If'\left(\theta_I^l\right)}{\left(f\left(\theta_I^l\right)+s_I^l\right)^2}\frac{d\theta_I^l}{da^l}>0$, $\frac{du_I^h}{da^l}=0$, $\frac{d\hat{e}_I}{da^l}=\frac{-y^l\frac{d\theta_I^l}{da^l}}{c'(\hat{e}_I)}<0$. *Q.E.D.*

In the first case, where $a^h=a^l=a$, an increase in negative attitudes increases the separation of immigrants and therefore makes it less profitable to open a vacancy. The reduction in labour market tightness for immigrants

reduces their bargaining power and thereby their wages. Immigrants' transition rate falls which together with their higher separation rate increases their unemployment rate.

Concerning educational choice, the impact depends on the impact on employment perspectives for high productivity workers relatively to the impact on low productivity workers. The reduced employment perspectives, through lower employment chances and lower wages, affect both high productivity and low productivity workers. However, due to higher productivity, the reduction in wages is going to be larger for high productivity workers than for low productivity workers and therefore the incentives to acquire education fall. The result is that fewer immigrants acquire education. As negative attitudes have no impact on the separation rate of natives, they are not affected.

For the second case, that is, where $a^h = 0$, $a^l > 0$, an increase in negative attitudes only increases the separation of low productivity workers and only for the low productivity firms hiring immigrants, there is a reduction in the profitability of opening a vacancy. The resulting reduced labour market tightness for low productivity firms hiring immigrants increases uneducated immigrants' unemployment rate. High productivity immigrants are not affected as their separation rate is not affected.

When we turn to educational choice, the result changes compared to in case 1. The employment perspectives for high productivity workers are not affected and as the employment perspectives of low productivity workers worsens, the incentives to acquire education increase. In this case, we therefore obtain the opposite result compared to in case 1, namely that more immigrants acquire education. Again, as negative attitudes have no impact on the separation rate of natives, they are not affected.

As a caveat. Notice, that we could allow for the possibility that negative attitudes affect the value of being unemployed also directly, and not only indirectly through wages and employment chances. In this case, the impact on unemployment will not be affected, but if, in case 1, negative attitudes directly diminish the value of being unemployment equally for uneducated and educated workers, then there is no impact on education. In case 2, the direct impact will also, as the indirect through employment and wages, tend to increase education.

4 Immigration

In this section, we examine the impact on labour market tightness, wages, education and unemployment from more immigration. Notice that $\lambda_I = tI$ and $\lambda_N = tN = t(1-I)$. The impact on labour market tightness, wages and unemployment as well as education will differ dependent on whether negative attitudes towards immigrants exists in both sectors or in the low productivity sector only. We have the following proposition.

Proposition: When the fraction of immigrants increases, labour market tightness facing immigrants increases, causing their unemployment rate to fall and their wages to increase. The improved labour market prospects of immigrants raise their level of education in both cases and the opposite holds for natives.

Proof: *For both cases: Differentiating equations (11), (12), (10) and (9) with respect to I delivers a positive impact on labour market tightness for immigrants and a negative impact on natives* $\frac{d\theta_I^m}{dI} = \frac{tkq(\theta_I^m)}{D_I^m} > 0$, $m = h, l$, $\frac{d\theta_N}{dI} = \frac{ktq(\theta_N)}{D_N} < 0$, $\frac{dw_I^m}{dI} = 0.5y^m\left(t + \frac{d\theta_I^m}{dI}\right)k > 0$, $\frac{dw_N^m}{dI} = 0.5y^m\left(-t + \frac{d\theta_N^m}{dI}\right)k < 0$. *Again for both case 1 and 2, we differentiate equations (16) and (17) with respect to I to obtain:*

$$\frac{du_I}{dI} = \frac{-s_I f'(\theta_I)}{\left(f(\theta_I) + s_I\right)^2}\frac{d\theta_I}{dI} < 0,\ \frac{du_I^m}{dI} = \frac{-s_I^m f'(\theta_I^m)}{\left(f(\theta_I^m) + s_I^m\right)^2}\frac{d\theta_I^m}{dI} < 0,\ \frac{du_N}{dI} = \frac{-s_N f'(\theta_N)}{\left(f(\theta_N) + s_N\right)^2}\frac{d\theta_N}{dI} > 0.$$

Concerning education, for case 1, we differentiate equation (14) with respect to I to obtain: $\frac{d\hat{e}_I}{dI} = \left(y^h - y^l\right)\frac{d\theta_I}{dI}/c'(\hat{e}_I) < 0$, $\frac{d\hat{e}_N}{dI} = \left(y^h - y^l\right)\frac{d\theta_N}{dI}/c'(\hat{e}_N) > 0$.

In the second case, the result for education for immigrants is: $\frac{d\hat{e}_I}{dI} = \left(y^h\frac{d\theta_I^h}{dI} - y^l\frac{d\theta_I^l}{dI}\right)/c'(\hat{e}_I) < 0$, which is negative as $\frac{d\theta_I^h}{dI} > \frac{d\theta_I^l}{dI}$. *Q.E.D.*

More immigrants will induce the fraction of immigrants to increase, improving networking and thus labour market tightness for firms hiring immigrants and therefore immigrants' transition rate. Similarly, networking

among natives fall, and thereby labour market tightness for natives falls. As networking both directly and indirectly has a positive impact on immigrants' wages, their wages increase whereas natives' wages fall. Furthermore, the increase in immigrant's transition rate reduces their unemployment rate and the corresponding reduction in natives' transition rate raise their unemployment rate. Finally, concerning education for immigrants, improved labour market conditions due to more networking are better for high productivity workers than low productivity workers, wherefore education increases.

As an illustration, consider the situation where $a = 0$ and hence $s_I = s_N$ and initially $N = I$. In this case, labour market tightness facing immigrants is equal to labour market tightness facing natives. The fraction of educated immigrants and natives are also identical, $\hat{e}_I = \hat{e}_N$ and thereby $c'(\hat{e}_I) = c'(\hat{e}_N)$. The increase in educated natives is therefore equal to the fall in the fraction of educated immigrants. However, a more realistic setup is where $N > I$ so that $\theta_N > \theta_I$ and thus $\hat{e}_I > \hat{e_N}$ (the fraction of natives acquiring skills is higher than the fraction of immigrants acquiring skills). In this case, $c(\hat{e}_I) < c(\hat{e}_N)$, and $|c'(\hat{e}_I)| > c'(\hat{e}_N)$, the impact through the lower educational costs will increase the impact on education. However, substituting from equation (11) and (12) we obtain that the positive impact of networking is smaller for immigrants than the negative impact from networking for the natives, $|d\theta_I/dI| < d\theta_N/dI$. Hence, given $N > I$ initially, the impact from an increase in the number of immigrants on their educational level may be smaller or larger than the negative impact on the educational level facing natives.

5 Immigration and Negative Attitudes

In this section we expand the model by allowing for the possibility that a higher fraction of immigrants aggravates negative attitudes, giving for case 1, $s_I^h = s_I^l = s_N(1 + a(I))$ and for case 2, $s_I^h = s_N$ and $s_I^l = s_N(1 + a(I))$. The idea is that more immigrants around increases the possibility of a multiethnic society, which for some people is a negative development. As results now in general becomes ambiguous we consider the special case where the the matching function takes the form $X_I^m = \sqrt{v_I^m u_I^m}$ and that $a'(I) = 1$.The impact on natives is identical to the impacts above.

Proposition: Natives are affected as above. For immigrants we have the following. In the first case, differentiating equations (11), including the matching function, $X_I^m = \sqrt{v_I^m u_I^m}$ with respect to I where now $a(I)$ we obtain $\frac{d\theta_I^m}{dI} \mid_{a(I)} = \frac{-k\left(s_N a'(I)\sqrt{\theta_I^m} - t\right)}{\left(k(\rho + s_I^m)1/\sqrt{\theta_I^m} + k\right)}$. Substituting for the solution for labour market tightness we obtain the condition for $a'(I) = 1$ $\frac{d\theta_I^m}{dI} \mid_{a(I)} \lesseqgtr 0 \Leftrightarrow z \gtreqless I$, where $z = \frac{s_N(2\rho tk + s_N(1-2tk)) - t^2 k}{s_N^2 tk}$. This implies that for case 1 we obtain $\frac{dw_I^m}{dI} \mid_{a(I)} \lesseqgtr 0$ *and* $\frac{d\hat{e}_I}{dI} \mid_{a(I)} \Leftrightarrow z \gtreqless I$,and that $\frac{du_I^m}{dI} \mid_{a(I)} > 0$ for $z \geq I$. In the second case, we obtain where $da^l/dI = 1$ that $\frac{d\theta_I^l}{dI} \mid_{a^l(I)} = \frac{-k\left(s_N\sqrt{\theta_I^l} - t\right)}{k(\rho + s_I^l)1/\sqrt{\theta_I^l} + k}$ and $\frac{d\theta_I^h}{dI} \mid_{a^l(I)} = \frac{tk}{k(\rho + s_I^l)1/\sqrt{\theta_I^l} + k} > 0$. For wages we have $\frac{dw_I^l}{dI} \mid_{a^l(I)} \lesseqgtr 0$ $z \gtreqless I$, $\frac{dw_I^h}{dI} \mid_{a^l(I)} > 0$, and education increases, $\frac{d\hat{e}_I}{dI} \mid_{a^l(I)} < 0$ and unemployment increases if $\frac{du_I^l}{dI} \mid_{a(I)} > 0$ for $z \geq I$, and $\frac{du_I^h}{dI} \mid_{a(I)} < 0$. .

The impact of immigration on labour market performance for immigrants now becomes ambiguous. The reason is that more immigration improves networking and thereby employment chances and wages, but at the same time, negative attitudes may become more severe which reduce labour market tightness again. In the first case, where $a^h = a^l = a(I) > 0$, the positive impact through networking on labour market tightness is more important than the negative impact through increased negative attitudes if the fraction of immigrants is sufficiently high. The condition for a positive sign for labour market tightness is dependent on the separation rate and the networking effect, so that in this case, the separation rate has to be low, low s, relatively to the networking effect, high t. In the second case, $a^h = 0$, $a^l = a(I) > 0$, high productivity workers are not affected and low productivity workers are effected as in case 1, implying that education unambiguously increases, as the relative gain of acquiring education increases.

6 Heterogeneous Networking Effects

In this section we allow the networking effects to differ for uneducated and educated workers as well as for natives and immigrants.[6] First, we consider the case where $s_I^m > s_N$, $m = h, l$, which results in the left hand side of (11) being larger than the left hand side of (12) and therefore tends to reduce labour market tightness for firms employing immigrants and thereby the transition rate for immigrants. Therefore, when immigrants face more networking than natives, $\lambda_I^m > \lambda_N^m$, we cannot determine the relative size of θ_I^m and θ_N^m as this networking effect would tend to increase labour market tightness for immigrants relative to natives. For the rest of this section we therefore consider the case where networking for immigrants is lower than networking for natives.

Regarding education, we now need to consider the more general equation, allowing labour market tightness to differ both for educated and uneducated natives as well as immigrants :

$$\left(y^h\theta_i^h - y^l\theta_i^l\right)k = c\left(\hat{e_i}\right),\ i = N, I. \tag{18}$$

To begin with, we assume that networking is the same for educated and uneducated immigrants and consider first the case where $\lambda_N^h > \lambda_N^l$. In this case, educated natives are more efficient using the network and we obtain that $\theta_N^h > \theta_N^l > \theta_I^h = \theta_I^l = \theta_I$, resulting in higher wages for educated native workers than uneducated native workers, (see equation (9)), who then in turn, as before, receive higher wages than immigrants (see equation (9) relative to (10) inserting for labour market tightness and networking). Furthermore, considering education, using equation (18) we obtain that a higher fraction of natives than immigrants acquire education, $\hat{e}_I > \hat{e}_N$, as $y^h\theta_I^h - y^l\theta_I^l < y^h\theta_N^h - y^l\theta_N^l$ if and only if $y^l\left(\theta_N^l - \theta_I^l\right) < y^h\left(\theta_N^h - \theta_I^h\right)$ as there is a larger gain involved for natives than immigrants acquiring education.

If instead, uneducated native workers are better at networking than educated natives workers, $\lambda_N^h < \lambda_N^l$, then there are relative more vacancies supplied towards uneducated native workers than educated native workers and hence, $\theta_N^l > \theta_N^h > \theta_I^h = \theta_I^l = \theta_I$. In this case, the order of educated native wages and uneducated native wages become ambiguous as the higher productivity of educated natives will tend to raise w_N^h relative to w_N^l whereas the higher networking effect for uneducated natives both directly and indirectly through a higher labour market tightness will tend to increase w_N^l relative to w_N^h. In terms of education, we cannot tell whether $\hat{e}_I > \hat{e}_N$ or $\hat{e}_I \leq \hat{e}_N$ as $y^l < y^h$ but $\theta_N^l - \theta_I^l > \theta_N^h - \theta_I^h$ as $\theta_N^l > \theta_N^h$ and $\theta_I^h = \theta_I^l = \theta_I$. This is the case as good networking for uneducated natives means that being uneducated tends to be more attractive for natives, but on the other hand, as networking is still better for educated natives than immigrants, this will tend to increase the number of educated natives.

Next, we allow the networking variable to vary also for immigrants. First, we consider the case where uneducated immigrants are more efficient using their network, that is, $\lambda_I^l > \lambda_I^h$. When $\lambda_N^h = \lambda_N^l$ then $\theta_N^h = \theta_N^l > \theta_I^l > \theta_I^h$, implying that natives are better paid but we cannot tell whether the uneducated immigrants or the educated immigrants earn the most, as the higher networking and labour market tightness for uneducated workers compared to educated workers tends to raise wages for this group but the latter group of immigrants has a higher productivity than the former. In this case, $\hat{e}_I > \hat{e}_N$ as $\theta_N^h = \theta_N^l$ and $\theta_I^l > \theta_I^h$ implying that uneducated immigrants are relative better off than educated immigrants in terms of transition into work. When instead $\lambda_N^h > \lambda_N^l$ then $\theta_N^h > \theta_N^l > \theta_I^l > \theta_I^h$, the conclusion concerning relative wages for natives is as above when we considered the same relative networking effects for natives and indeterminate for immigrants. We also have that $\hat{e}_I > \hat{e}_N$ as the uneducated immigrants are relative better off than educated immigrants in terms of transition into work and the reverse holds for natives, making the impact even stronger. Finally, when $\lambda_N^l > \lambda_N^h$ then $\theta_N^l > \theta_N^h > \theta_I^l > \theta_I^h$. Here the relative sizes of low and educated wages are ambiguous for both natives and immigrants and we cannot determine the relative skill levels for natives and immigrants as we do not know the relative size of $\theta_N^l - \theta_N^h$ and $\theta_I^l - \theta_I^h$.

When there are more educated immigrants than uneducated immigrants, that is, $\lambda_I^h > \lambda_I^l$, then $\theta_I^h > \theta_I^l$, and relative labour market tightness for natives and thereby wages will vary as above dependent on the relative size

[6] As we do not allow networking effects to depend on the number of each educational type (as then labour market tightness would be a function of $\hat{e}_i$, $i = N, I$) then this corresponds to assuming that t^m is different for the two different educational types.

of λ_N^h and λ_N^l. Here, we know that $w_I^h > w_I^l$ as networking, labour market tightness and productivity move in the same direction. We cannot determine whether a higher fraction of immigrants or natives acquire education as we do not know the relative size of $\theta_N^l - \theta_N^h$ and $\theta_I^l - \theta_I^h$.

In the second case, when negative attitudes exist for low productivity workers only, that is when, $s_N = s_I^h < s_I^l$, then if networking is the same for uneducated and educated immigrants, but higher for educated natives than uneducated natives, i.e. $\lambda_N^h > \lambda_N^l > \lambda_I^h = \lambda_I^l$, then we obtain $\theta_N^l > \theta_N^h > \theta_I^h > \theta_I^l$ and the wage order is similar and the order of unemployment rates is $u_N^h < u_N^l < u_I^h < u_I^l$. We cannot determine the relative size of $\hat{e}_I$ and $\hat{e}_N$ unless we know the relative size of $\theta_N^h - \theta_I^h$ and $\theta_N^l - \theta_I^l$. If instead, uneducated native workers have a better network than educated natives workers, $\lambda_N^h < \lambda_N^l$, then there are relative more vacancies supplied towards uneducated native workers than educated native workers and hence, $\theta_N^l > \theta_N^h > \theta_I^h > \theta_I^l$. As above with equal separation rates for immigrants, we cannot determine the relative size of immigrant wages and education, as $y^l < y^h$ but $\theta_N^l - \theta_I^l > \theta_N^h - \theta_I^h$.

When uneducated immigrants have a better network than educated, that is, $\lambda_I^l > \lambda_I^h$, then when $\lambda_N^h = \lambda_N^l$ we obtain that $\theta_N^h = \theta_N^l$ but we cannot determine the relative size of θ_I^l and θ_I^h, something which still holds when $\lambda_N^h > \lambda_N^l$ where for natives we now obtain $\theta_N^h > \theta_N^l$ and we can still not determine the relative size of labour market tightness for immigrants. Finally, when $\lambda_N^l > \lambda_N^h$ then $\theta_N^l > \theta_N^h$ and the relative size of θ_I^h and θ_I^l remain ambiguous. Relative wages follow the order of labour market tightness for natives and are indeterminate for immigrants. We cannot determine whether $\hat{e}_I > \hat{e}_N$ or $\hat{e}_I \leq \hat{e}_N$ as we do not know the relative size of θ_I^h and θ_I^l.

When educated immigrants are more efficient using their network than uneducated, that is, $\lambda_I^h > \lambda_I^l$ then we obtain the same relative labour market tightness for educated and uneducated natives as above as well as wages. In none of these situations, we can determine the relative skill levels for natives and immigrants as we do not know the relative size of $\theta_N^l - \theta_N^h$ and $\theta_I^l - \theta_I^h$.

7 Macro-econometric Analysis

7.1 Data

In this section, we test the model predictions regarding the impact of networking and negative attitudes on education. We consider macroeconomic data for Denmark in 2002 and explore the variation between municipalities. Denmark is chosen for two reasons. Firstly, there is detailed and rich data available both at the municipality and individual level (where we have data for the whole population) which enables the impact of negative attitudes on education to be examined both at the macro and micro level. Secondly, the educational structure of Denmark allows us to explore an individual's decision of whether to attend high school, which is non-compulsory, after the completion of compulsory education at a young age. As this decision takes place at such a young age, mobility of the student is of very little concern, which is discussed further below. In 2002, there are 275 municipalities in Denmark. 2002 is chosen as there is a general election in 2001 and it is well prior to 2007 when the 275 municipalities are merged into 98 municipalities. The fundamental idea behind using macro data is to potentially show some correlation between the general prevalence of negative attitudes in a municipality and the expected return to education, through employment perspectives and the fraction of immigrants attending high school. The impact may thus be both direct and indirect, and in this sense we may capture something different than if we were to only consider micro data. Furthermore, the macroeconomic nature of the theoretical model, makes the macro-econometric analysis a natural starting point. As controls, we include gross income per capita in the municipality, population density, a dummy for the presence of at least one high school in a municipality, and the percentage of the labour force (LF) with short, medium and long tertiary education. Throughout the macro section, we examine the fraction of both immigrants and descendants attending high school and use the terms immigrants and descendants and immigrants interchangeably.

In order to disregard mobility issues, we examine the high school decision as a function of immigration and attitudes as well as other explanatory variables. For example, we want to avoid a case where a lack of networking

possibilities or negative attitudes causes the student to move. High school students are most likely to stay at home during their high school education and we consider the possibility that parents move as a reaction to the networking or negative attitudes to be tiny (however, we do approach this possibility in the Robustness Section).

Our main dependent variable is the fraction of immigrants in a municipality at age 16 attending any high school in year 2002. In Denmark, students' first year in high school will be when they are 15-16 years old. Only the first 9 years of schooling are obligatory in Denmark.[7] High school is optional, and most of the students beginning high school will graduate with a high school degree. Moreover, in this paper we aim to evaluate whether the potential impact of negative attitudes and immigration on relative labour market performance for educated and uneducated workers influence the decision to begin high school.

As the negative attitude variable we consider two different measures. The first variable is the fraction of votes for two parties, Fremskridtspartiet and Dansk Folkeparti due to their emphasis on reducing immigration.[8] One potential concern in using voting data is that immigrants may not vote for parties who emphasise reducing immigration. This would be problematic for our measure of negative attitudes as municipalities with higher concentrations of immigrants could actually have few votes for Fremskridtspartiet and Dansk Folkeparti. However, the voting behaviour of immigrants and descendants is unable to influence our measure of negative attitudes as only natives are permitted to vote in general elections. As such, the voting data is a good measure of the negative attitudes of natives against immigrants. Furthermore, the 2001 general election campaign had a huge emphasis of immigration, implying a large increase in the votes for Fremskridtspartiet and Dansk Folkeparti. The second variable is taken from a survey and is the fraction of surveyed persons in a municipality who answers that they agree that immigrants should be sent back to their home country if there is no more work for them in Denmark. There are 1500 respondents to the survey. For the networking variable, we include the fraction of immigrants and descendants relative to the total population in the municipality.

Figures 1 and 2 show the dispersion of the fraction of votes for Fremskridtspartiet and Dansk Folkeparti and the fraction of immigrants and descendants residing in the municipality. Votes for the two parties are relatively scattered across Denmark, with a high concentration of municipalities with a large fraction of votes for both parties near the Danish/German border. Immigrants and descendants are also scattered across Denmark, with the exceptions that they tend to reside closer to large cities (Aarhus, Odense, and the greater Copenhagen area) as well as near the Danish/German border.

[Figure 1 about here.]

[Figure 2 about here.]

Table 1 presents descriptive statistics of the municipal data. While the total number of municipalities in Denmark during the time period is 275, we drop 9 municipalities as there were no 16 year old immigrants residing in them.[9] From Table 1, it is seen that the average share of 16 year old immigrants in high school is about 33.1% while it is larger for natives, 52.9%.

[Table 1 about here.]

For immigrants, the minimum share is 0 and the maximum share is 1, so there are municipalities with no 16 year old immigrants in high school and we also find municipalities with 100%. These extreme numbers are a

[7] Only recently a grade zero has become obligatory.

[8] Fremskridtpartiet's webpage: http://www.fremskridtspartiet.dk/page9.html (all in Danish: main idea: immigrants may stay for shorter or longer periods).

Dansk Folkeparti's webpage (http://www.danskfolkeparti.dk/ The_Party_Program_of_the_Danish_Peoples_Party): *Denmark is not an immigrant-country and never has been. Thus we will not accept transformation to a multiethnic society.*

Denmark belongs to the Danes and its citizens must be able to live in a secure community founded on the rule of law, which develops along the lines of Danish culture.

It ought to be possible to absorb foreigners into Danish society provided however, that this does not put security and democratic government at risk. To a limited extent and according to special rules and in conformity with the stipulations of the Constitution, foreign nationals should be able to obtain Danish citizenship.

Other Danish parties may also be interested in limiting immigration but not to such an extent that it is on their official webpage.

[9] The municipalities we drop are: Fuglebjerg, Holeby, Højreby, Rudbjerg, Sydlangeland, Nørhald, Fjends, Læsø and Åbybro.

consequence of the size of the municipality and the total number of 16 year old immigrants in such municipalities and therefore describe the behaviour of only a very limited set of individuals. In an alternative specification, we will present regression results weighted by a relevant measure of population to better try to take such features of the data into account.

The two measures used for negative attitudes have average values of 13% (election data) and 20 % (survey data) respectively. The network measure for immigrants is on average 4.9%, while the pseudo-network variable for natives has an average of 95.1%. The average values of the different unemployment measures range from 3.6% to 11%, with the maximum average value for the immigrants from non-Western countries. The average (of average) gross income level per capita is 173000 DKK and the average population density is 0.271 people per square kilometre. Population density is included to account for the degree of urbanisation of a municipality. The average shares of the population with a short, medium and long education respectively are 40%, 11% and 3%. Comparing the mean values and the medium values of all variables we see that in some cases – especially for variables involving immigrants – the distributions are quite skewed.

7.2 Econometric Model and Results

As stated above, we want to disregard mobility taken by the individual due to different labour market conditions or attitudes. We therefore estimate

the high school decision by examining the following model:

$$(1 - \hat{e}_r) = \beta_0 + \beta_1 a_r + \beta_2 \lambda_r + \sum_{\eta} \beta_{r\eta} Controls_{r\eta} + \varepsilon_r, r = 1, ..., 266. \tag{19}$$

The left hand side variable, $(1 - \hat{e}_r)$, is either the fraction of young 16 years old immigrants/descendants attending high school in year 2002 (our main group of interest) or for control purposes the same type of fraction for natives. Ideally, for identification we would expect both the attitude and the network variables to be significant for immigrants while being insignificant for natives. We examine whether negative attitudes, a_r, and the fraction of immigrants through a potential networking effect, $\lambda_r = tI$ have any impact on the fraction of young immigrants (16 years old) attending high school.

Table 2 presents estimation results of equation 19, where columns (1) and (2) use the voting measure of negative attitudes for natives and immigrants respectively, while columns (3) and (4) use the survey measure of negative attitudes for natives and immigrants respectively. Consistent with expectations, the negative attitudes voting measure is negative and significant at the 10% level for immigrants, with a coefficient of -1.993. This implies that a 1 percentage point increase in the share of votes for the two parties leads to a decrease of approximately 2 percentage point in the fraction of 16 years old immigrants who chooses high school.[10] The negative effect of negative attitudes on immigrants' educational attainment is consistent with case 1 of the model, where negative attitudes are present in both the low and high productivity sectors. The coefficient of the immigrant networking variable is positive and also significant (at the 1% level), consistent with both cases of the model. For the immigrant estimation, most of the coefficients of the control variables are imprecisely estimated and insignificant. In fact, the only variable which is significantly estimated (at the 10% level) is the dummy for high school presence. This coefficient is as expected positive.

[Table 2 about here.]

For the natives regression, we expect to find no significance for the negative attitude and networking variables. For both variables the coefficient estimates are in fact significant even though the size or sign of the coefficients are different from the immigrant case. The coefficient of the attitude variable for the natives is less than half the size of what is seen for immigrants and the coefficient of the networking variable has the opposite sign:

[10] For example, if Hørsholm with initially 8.7% votes for the two parties increased this share to 9.7% (the level of Hillerød) and assuming that all other variables for Hørsholm are kept unchanged this will lead to the expected change in high school rate mentioned in the text.

increasing the fraction of natives residing in a municipality decreases the fraction of natives enrolled in high school. One potential explanation of this negative effect could be that larger shares of natives reside in more rural municipalities, and these rural municipalities are also less educated. In addition, for natives, only the population density control is significant (5% level) and negative.

Examining the results based on the survey measure of negative attitudes, we get somewhat different results for immigrants. The negative attitudes variable for immigrants is still negative but now insignificant, and the size has decreased to -0.103. The network variable is still very significant, although somewhat smaller in size. Finally the high school dummy is significant (at 10% level) and positive as expected. The other control variables are, as before, insignificant. The results for the natives are essentially unchanged. It is worth noting that the number of observations is much lower when using the survey variable for negative attitudes; this is due to the rather limited number of replies to the survey in certain municipalities, and those municipalities are dropped from the estimation. As a consequence, the different results for the two attitude measures may relate to the measures being different or to the differences in the samples on which the estimations are based.

In general, the results of the macro estimation are not quite as expected based on the propositions of the theoretical model. To improve the model we have first tried various non linear specifications, such as adding the square of the population density measure and adding interaction terms of our two explanatory variables of interest, and in none of these extended specifications did we get more significance. [11]

Next, we consider the possibility that maybe the equal weighting in the OLS estimation of both small and large municipalities have been influencing our results. In one additional regression we drop municipalities with less than five 16-year-old immigrants, and no fundamental changes in the results were observed (results are available upon request). As mentioned previously, we also weight the OLS regressions of (19) by the number of 16-year-olds immigrants or natives, respectively. Table 3 shows results for such weighted regressions. When doing so, all significance in the negative attitude measures disappears for the immigrant estimations, the magnitude of the networking variable falls for the immigrant estimation but still remains significant, and the estimation for natives is basically unchanged for the attitude and networking variables. Hence, after having performed these weighted regressions, the regressions for immigrants are somewhat sensitive, while we find quite a large amount of robustness for the natives regressions. These findings seem to indicate that, to a large extent, small municipalities with few 16 year old immigrants drive the earlier results. On the one hand this is perhaps unsurprising, as one may expect that the effects of negative attitude may be stronger in small and less urban municipalities, while on the other hand, it also points to the desirability of moving towards an analysis using individual level data.[12]

[Table 3 about here.]

Despite the fact that we find some support for our theoretical prediction for networking among immigrants, moving to the individual level enables many individual and family level factors to be taken into account which cannot be at the municipal level. This is particularly important given that the results at the municipal level appear to be driven by municipalities with few number of 16 year old immigrants. Section 8 estimates the impact of negative attitudes on the educational choices of 16 years old immigrants and natives rather than on the share of immigrants and natives attending high school in a municipality, allowing us to better capture the relationship between negative attitudes and an individual's educational decisions.

[11] We also investigated whether multicollinearity might be a problem for significance of many of our explanatory variables but simple correlations and other indicators did not point towards major problems of this kind.

[12] We also collected additional data to try to benefit from the advantages from allowing for fixed municipality effects in a two wave panel framework. This exercise was performed for the election measure of the attitude variable only. Hence, we collected election data from the general election in 1998 and the other variables for 1999. Again no improvement was observed based on the estimation of such a fixed effects model (results are available upon request).

8 Micro-econometric Analysis

8.1 Data

In order to examine the individual level relationship between immigrant high school attendance and negative attitudes towards immigrants and networks, we use detailed Danish Register Data made available by Statistics Denmark. Danish Register Data is a database containing detailed information on every resident of Denmark from 1980-present. The data is interlinked across various government and administrative sources by an anonymous personal identification number, so individuals are also observed overtime. As with the macroeconomic analysis, we consider an immigrant's high school decision in 2002. The data used contains similar, but more detailed information compared to the macro-econometric data and is composed of: education history (information such as where an individual attends school and what qualification they are studying towards and have already achieved); demographic information such as gender, age, and municipality of residence; immigration history (including an individual's nationality, exact date of immigration, and whether an individual is a 1st or 2nd generation immigrant; and household characteristics such as family composition and parental information. As individuals are linked to their parents, it is possible to include factors such as parental education, employment history, and marital status, all of which will likely affect an immigrant's high school decision.

To capture negative attitudes, we use the same voting data at the municipal level, and many other control variables which are included in the macro-econometric analysis are also included as controls in the micro-econometric analysis. In the micro section, we also consider the high school choice of both immigrants and descendants in one measure. We do so in order to explore how the effects of negative attitudes on education depend on an individual's gender, as sample sizes when combining the two groups are sufficiently large.[13] By using individuals' municipalities of residence, we are also able to construct exact sums of immigrants from a certain nation residing in every Danish municipality. By interacting these sums with an immigrant's own nationality, we are able to recreate an individual's potential network based on the fraction of the population living in his municipality from his homeland (excluding the immigrant him or herself). For 16 year old immigrants deciding whether to attend high school, the presence of other immigrants from their homeland may significantly impact this decision. Using education and employment data, we are able to construct the education and employment levels of immigrants by nationality for each municipality, which is consistent with the influence of immigration through networking in the theoretical model presented above.

Summary statistics of all relevant variable are included in Table 4.

[Table 4 about here.]

8.2 Econometric Model and Results

We estimate the following equation separately for natives and immigrants/descendants:

$$\begin{aligned}(1-\hat{e}_i) = \beta_0 &+ \beta_1 FracOwnNatEduc_r + \beta_2 FracOwnNatEmp_r \\ &+ \beta_3 FracOwnNat_r + \beta_4 a_r + \beta_5 ParentEdu_p + \\ &\sum_{\mu} \beta_{r\mu} MuncControls_{r\mu} + \sum_{\eta} \beta_{i\eta} HHControls_{i\eta} + Origin_i + \varepsilon_i, \end{aligned} \tag{20}$$

where $(1-\hat{e}_i)$ is the educational decision of individual i represented by a dummy variable if an individual is attending any high school or not, which is determined by: three networking variables — $FracOwnNatEduc_r$, $FracOwnNatEmp_r$, and $FracOwnNat_r$ which represent the fraction of individuals of the same nationality residing the same municipality r who have (at least) a high school education, the fraction of same nationality individuals residing the same municipality r who are employed, and the fraction of same nationality individuals residing the same municipality r respectively; a_r, negative attitudes captured by the fraction of votes for both

[13] Section 9.2 provides a comparison of the high school choice of immigrants and descendants.

Fremskridtspartiet and Dansk Folkeparti in municipality r; $ParentEdu_p$, the years of education of parent p where $p = mother, father$, $MuncControls_r$; municipal factors such as population density and the fraction of immigrants/natives unemployed which may affect an individuals education decision; $HHControls_i$, additional household controls such as parental employment status, total household income, and parental marital status; $Origin_i$, origin country dummies that capture educational differences across specific immigrant/descendant home countries; and ε_i, residual unobservables which are clustered at the municipality level. In order to identify the effects for immigrants/descendants, we separately estimate equation (20) for natives and for immigrants and descendants.

Tables 5 and 6 present results for males and females respectively. Similar to the municipality estimation, columns (1) and (2) present results for natives and immigrants respectively. Column (3) is provided for the sake of comparison and includes only the municipal fraction of own nationality immigrants as a measure of networking, as this is a measure which is directly comparable to our networking measure in the macro-econometric analysis.

[Table 5 about here.]

[Table 6 about here.]

Examining males in Table 5, the fraction of own nationality individuals employed significantly increases the propensity of an immigrant to attend high school, where a one percentage point increase in the fraction of own nationality immigrants employed residing in the municipality would lead to a 0.48 percentage point increase in the probability of attending any high school. No equivalent significant effects are seen for natives, a finding which is consistent with networking amongst immigrants. The other networking variables, the fraction of own nationality individuals residing in the same municipality and the fraction of own nationality individuals with at least a high school education, are imprecisely estimated for both natives and immigrants. This is consistent with our theoretical model, where employment prospects are key in determining the level of education an individual obtains, and it is reassuring that networking in terms of employed immigrants matters. The negative attitudes measure significantly increases an immigrant's probability of attending high school, where a 1 percentage point increase in the fraction of votes for either political party significantly increases the probability of attending any high school 1.5 percentage points, while no effects are seen for natives. For both natives and immigrants, household controls matter a lot for an individual's propensity to attend high school, with education, employment, and marital status of both parents significantly increasing the probability of attending high school in nearly all specifications.

For females, in Table 6, a different picture is seen. While the fraction of own nationality immigrants leads to a significant and positive increase in the probability of attending high school for immigrants, a significant negative effect is seen for natives for the fraction of own nationality natives with education to high school or beyond. For both natives and immigrants, the negative attitudes measure is insignificant on high school attendance. Similar to the male estimation, parental education, employment, and marital status significantly increase the probability of attending high school for both natives and immigrants.

Contrary to the macro-econometric analysis we find evidence that for males, negative attitudes towards immigrants increase the propensity of an immigrant/descendant to attend high school. For females, this effect is insignificant. For natives, no significant effects are seen for males nor for females. These differences from the macro-econometric results are not due to differences in specifications or control variables, as only including a networking measure which is comparable to the macro-econometric measure of networking does not alter the results. The positive effect of negative attitudes on male immigrant education supports the second case of the theoretical model, where negative attitudes may have differential effects on immigrants/descendants' propensity to attend high school depending on their productivity levels. In the case where high productivity workers are comparable to natives, as outlined in Section 3, negative attitudes only affect low productivity workers. This leads to lower employment perspectives for these low productivity workers, lowering the future wages that young immigrants expect to receive and increasing the incentives of young immigrants/descendants to acquire education.

9 Robustness of Micro-econometric Results

We explore the robustness of our micro-econometric analysis in the following subsections. In particular, we explore how negative attitudes affect immigrants compared to descendants as well as examine how the mobility of immigrants and descendants within Denmark affect the results obtained in Section 8.

9.1 Exploring Mobility of Immigrants and Descendants

While the results presented in Section 8 are supportive of the second case of the theoretical model, it is possible our estimation fails to properly estimate the impact of negative attitudes on high school attendance. In particular, we focus on the educational decision of 16 year old individuals in order to disregard mobility concerns, as students of this age are likely to reside at home in this period. While this may be the case, it could be that parents either selectively locate to certain municipalities or move as a reaction to negative attitudes in a municipality. This would create problems for our analysis, particularly if immigrant families who move do so in order to avoid negative attitudes against them. We examine the possibility that movers are driving the positive effect of negative attitudes we see for males in Appendix A by exploring if our results are stable to restricting the sample to individuals who have resided in the same house for 3 or more years and 6 or more years. Similarly, we look at years since immigration for the non-native sample in order to see if recent immigrants, who could have selectively located within Denmark, are driving our results.

On the whole, the results presented in Appendix A are very similar to the main results. For males, the negative attitude variable always increases the propensity to attend high school for immigrants/descendants, while there is no effect seen for natives. This is true for both the 3 or more years restriction as well as the 6 or more years restriction. The fraction of own nationality immigrants employed also increases an immigrant's propensity to attend high school, a finding which is consistent with the main results of Section 8. For females, the effects of negative attitudes for natives and immigrants remain insignificant when imposing the years since moved restriction.

A similar pattern is seen for estimation restricting the time since immigration for immigrants and descendants; the positive estimated effect of negative attitudes on the propensity to attend high school remains for males and is still insignificant for females.[14] The effect of negative attitudes on high school attendance is remarkably robust for male immigrants, and is not driven by either mobility within Denmark or selective migration, while for female immigrants, this relationship remains insignificant.

9.2 Comparing Immigrants to Descendants

Table 13 analyses the high school decision of immigrants and descendants separately, allowing the effects of negative attitudes on education to affect the two groups differently. While immigrants and descendants can both be impacted by negative attitudes, descendants have been raised in Denmark and may have assimilated more compared to immigrants. As we expect that descendants may be less adversely impacted by negative attitudes, finding a larger impact of negative attitudes on immigrants than on descendants would support that the voting data captures negative attitudes while finding a larger impact for descendants would raise concerns about the validity of this measure. Due to the few numbers of descendants in a given municipality, males and females are combined into one sample, and a dummy for male is included as a control variable. For the same reason, the results presented in Table 13 should be interpreted with some caution, as there are some municipalities with very few descendants residing in them.

Estimation using only immigrants is reported in column (1) of Table 13 while estimation on a sample of only descendants is reported in column (2). Comparing these two columns reveals that the positive impact of negative attitudes on high school attendance seen previously is driven by the impact of negative attitudes on immigrants, while virtually no effect is seen on the probability of attending high school for descendants. It is

[14] Descendants, by definition, have "immigrated" when they are born, so all descendants are included in both the years since immigrated tables.

also reassuring that household and municipality controls are relatively similar for immigrants and descendants, as while negative attitudes may affect the two groups differently, there is less reason to believe that immigrants and descendants would be differentially affected by other controls.

10 Conclusion

We considered the impact of negative attitudes and immigration on educational choice of immigrants and natives. We did this theoretically and empirically.

Theoretically, we formulated a Becker-style taste discrimination model within a search and wage bargaining setting. We assumed that potential negative tastes towards immigrants implied that their separation rate from the job was higher than the separation rate of a native worker. Furthermore, we allowed for networking effects, which increased the probability of obtaining employment. We included endogenous education, where a higher expected income as educated in terms of both employment chances and wages relative to the expected income as uneducated, increases the number of educated workers. We considered two different cases. In the first case, discrimination existed for all immigrants, while it was only present in the sector employing uneducated workers in the second case. We found that an increase in negative attitudes reduced education for immigrants in the first case, increased education in the second case, where there was no impact on natives in the two cases. We also found that more immigration improved employment perspectives for immigrants and thereby increased the fraction of educated immigrants due to increased networking. Finally, we considered endogenous negative attitudes in the sense that more immigration increased negative attitudes. In this case, the impact of more immigration on the educational level of immigrants was ambiguous.

Empirically, we considered an immigrant's high school attendance as a function of the variables in the theoretical model. Considering high school attendance allowed us to disregard mobility issues for the individual acquiring education. On the macro-level, we confirmed the result from the first case of the model, namely an existence of a negative correlation between negative attitudes towards immigrants and high school attendance by exploring the variation between 266 municipalities in Denmark. As identification, we ran the regression for natives, and found no significant correlation. Weighting this regression by the total number of 16 year old immigrants in the municipality reveals that smaller municipalities with few 16 year old immigrants may be driving these results. On the individual level, we used Danish register data to find a positive impact of networking on high school attendance, whereas the impact of negative attitudes has a positive and significant effect on male immigrants, and a positive but insignificant effect for female immigrants. This is consistent with the second case of the theoretical model, where negative attitudes are prevalent in the sector hiring low skilled workers and more severe negative attitudes increase the incentives to acquire education. We explore the validity of disregarding mobility by estimating the same regressions on immigrants and natives who have not moved or immigrated recently, and find virtually identical effects of negative attitudes on education.

If negative attitudes are most prevalent in the uneducated sector, and the second case of the model is then the most realistic one, negative attitudes cannot be the explanation behind the lower fraction of immigrants attending high school. Rather, one potential benefit from negative attitudes towards immigrants may be that they induce more immigrants to continue school beyond the 9th grade and thus improve their employment chances, wages, and expected lifetime income significantly. On the other hand, as immigrants tend to benefit from networking with their own nationality, a low fraction of immigrants in a municipality seems to partly explain the low fraction of immigrant high school attendance. Hence, our results indicate that potential immigrant high school students have higher incentives to attend high school in an area where many of their own nationality lives as it improves their networking chances. While we cannot exclude that variables other than negative attitudes and networking can explain the high school educational gap between immigrant and natives, the main empirical finding of this paper is that, when negative attitudes affect only low skilled workers, more immigrants of ones own nationality and more severe negative attitudes in a region increases the fraction of immigrants attending high school.

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Figure 1: Municipal Fractions of Votes for Fremskridtpartiet and Dansk Folkeparti in 2001 General Election

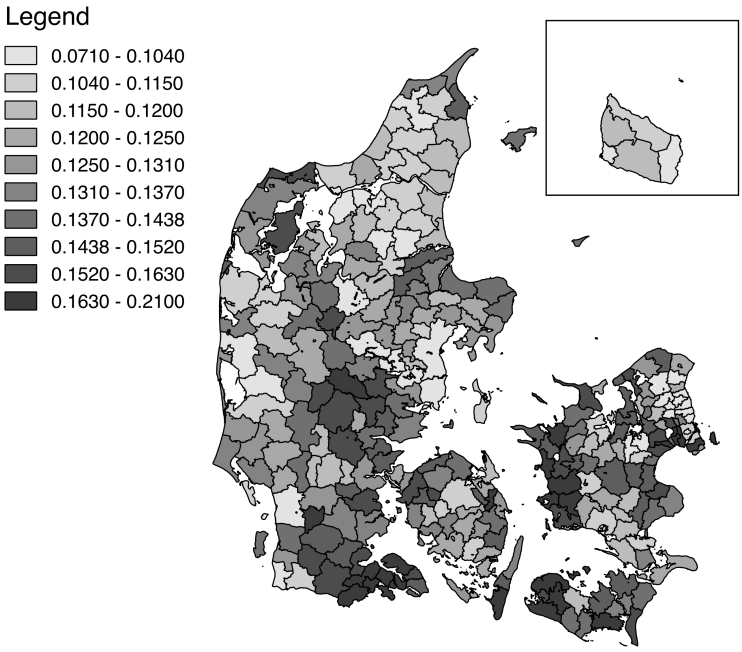

Figure 2: Municipal Fractions of Immigrants and Descendants Residing in Municipality

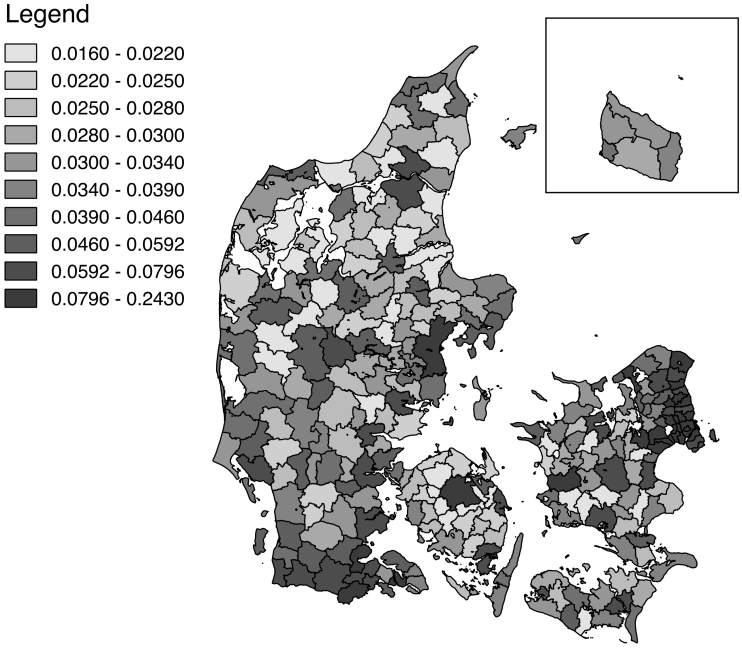

Table 1: Summary Statistics at the Municipal Level

	(1) Mean	(2) Median	(3) Std Dev	(4) Min	(5) Max
Share of 16 year old immigrants in any high school	0.331	0.333	0.245	0.000	1.000
Share of 16 year old natives in any high school	0.529	0.524	0.074	0.368	0.763
Negative attitude variable based on 2001 election data	0.132	0.130	0.023	0.071	0.210
Fraction with negative attitudes, survey	0.196	0.128	0.258	0.000	1.000
Network for immigrants (share of immigrants/descendants)	0.049	0.037	0.032	0.020	0.252
'Network' for natives (share of natives)	0.951	0.963	0.032	0.748	0.980
Unemployment rate, immigrants, western countries	0.051	0.046	0.032	0.000	0.182
Unemployment rate, immigrants non-Western countries	0.110	0.091	0.094	0.000	0.727
Unemployment rate, natives	0.036	0.033	0.013	0.015	0.096
Gross income per capita in 100000 DKK	1.726	1.671	0.192	1.448	2.771
Population density	0.271	0.071	0.819	0.019	10.413
Share with short education	0.401	0.402	0.034	0.271	0.503
Share with medium education	0.106	0.102	0.028	0.063	0.242
Share with long education	0.031	0.023	0.028	0.007	0.204
Fraction with high school in municipality	0.477	0.000	0.500	0.000	1.000
Observations	266				

Table 2: High School Participation for Immigrants and Natives at the Municipal Level

	(1) Frac Native Enrolled HS	(2) Frac Imm Enrolled HS	(3) Frac Native Enrolled HS	(4) Frac Imm Enrolled HS
% Fremskridtspartiet and Dansk Folkeparti GE 2001	-0.778***	-1.993*		
	(0.207)	(1.037)		
% Munc. Pop with Neg. Attitudes			0.002	-0.103
			(0.015)	(0.086)
% Native	-0.130		0.151	
	(0.114)		(0.092)	
% Immigrants/Descendants		2.464***		1.951***
		(0.596)		(0.557)
% Natives Unemployed	-0.878**		-0.957***	
	(0.265)		(0.317)	
% Western Imm Unemp.		-0.920		-0.497
		(0.621)		(0.703)
% Non-Western Imm Unemp.		-0.193		-0.286
		(0.180)		(0.241)
Gross Income Per Capita/100000	0.072	0.087	0.001	0.158
	(0.049)	(0.238)	(0.063)	(0.269)
Population Density (per 1000)	-0.007**	0.010	-0.008**	0.005
	(0.003)	(0.012)	(0.003)	(0.012)
% of LF with Short Tertiary Educ.	0.081	-0.297	0.189	-0.685
	(0.169)	(0.773)	(0.221)	(0.915)
% of LF with Medium Tertiary Educ.	-0.266	-1.166	-0.012	-0.985
	(0.176)	(0.964)	(0.1845)	(0.877)
% of LF with Long Tertiary Educ.	0.127	-2.163	0.825	-1.768
	(0.439)	(1.995)	(0.505)	(2.180)
High School in Municipality	0.011	0.060*	0.023***	0.067*
	(0.007)	(0.037)	(0.008)	(0.040)
R^2	0.234	0.076	0.195	0.082
N	266	266	220	220

Standard errors in parentheses are robust to heteroscedasticity. Neg. Att. is the negative attitude variable which is either measured as the share of votes for the Fremskridtspartiet or Dansk Folkeparti or as the share of people with a negative attitude from the survey. Network of the immigrants and descendants is measured as the fraction of immigrants and descendants in the municipalities. For the natives we include the same type of share-variable. Vocational education is included in the short tertiary category. Medium education also includes bachelor degrees. An intercept is included in the model but not reported in the table. * p<0.10, ** p<0.05, *** p<0.01.

Table 3: High School Participation for Immigrants and Natives at the Municipal Level - Weighted by Number of 16 Year Old Natives and Immigrants

	(1) Frac Native Enrolled HS	(2) Frac Imm Enrolled HS	(3) Frac Native Enrolled HS	(4) Frac Imm Enrolled HS
% Fremskridtspartiet and Dansk Folkeparti GE 2001	-0.561***	0.346		
	(0.198)	(0.663)		
% Munc. Pop with Neg. Attitudes			0.018	-0.008
			(0.015)	(0.061)
% Native	0.117		0.313	
	(0.097)		(0.086)	
% Immigrants/Descendants		0.813***		0.882***
		(0.302)		(0.252)
% Natives Unemployed	-0.842***		-0.996***	
	(0.273)		(0.290)	
% Western Imm Unemp.		-0.509		-0.313
		(0.481)		(0.525)
% Non-Western Imm Unemp.		-0.035		-0.050
		(0.158)		(0.181)
Gross Income Per Capita/100000	0.066	-0.016	0.017***	0.071
	(0.051)	(0.156)	(0.054)	(0.163)
Population Density (per 1000)	-0.005	0.004	-0.005*	0.005
	(0.003)	(0.006)	(0.003)	(0.006)
% of LF with Short Tertiary Educ.	0.185	0.835	0.197	0.684
	(0.151)	(0.571)	(0.181)	(0.608)
% of LF with Medium Tertiary Educ.	-0.387**	-0.354	-0.119	-0.539
	(0.194)	(0.628)	(0.194)	(0.653)
% of LF with Long Tertiary Educ.	0.369	0.360	0.719	-0.212
	(0.453)	(1.466)	(0.468)	(1.536)
High School in Municipality	0.021***	0.187***	0.027***	0.180***
	(0.007)	(0.030)	(0.008)	(0.033)
R^2	0.322	0.299	0.305	0.300
N	266	266	220	220

Standard errors in parentheses are robust to heteroscedasticity. Neg. Att. is the negative attitude variable which is either measured as the share of votes for the Fremskridtspartiet or Dansk Folkeparti or as the share of people with a negative attitude from the survey. Network of the immigrants and descendants is measured as the fraction of immigrants and descendants in the municipalities. For the natives we include the same type of share-variable. Vocational education is included in the short tertiary category. Medium education also includes bachelor degrees. An intercept is included in the model but not reported in the table. * p<0.10, ** p<0.05, *** p<0.01.

Table 4: Summary Statistics at the Individual Level

	(1)
% Fremskridtspartiet and Dansk Folkeparti GE 2001	0.1274
	(0.0241)
Munc. Unemployment Rate	0.0521
	(0.0150)
Munc. Population Density	709.8157
	(1507.2081)
Munc. Gross Income Per Cap/10000	17.5920
	(2.0569)
Native	0.9399
	(0.2377)
Immigrant	0.0382
	(0.1918)
Descendant	0.0219
	(0.1463)
% of Natives Aged 16 in Regular HS	0.6981
	(0.0000)
% of Imm./Desc. Aged 16 in Regular HS	0.5046
	(0.0000)
% of Natives Aged 16 in Any HS	0.7424
	(0.0000)
% of Imm./Desc. Aged 16 in Any HS	0.5265
	(0.0000)
Male	0.5106
	(0.4999)
Mother Years of Education	12.5465
	(2.9230)
Father Years of Education	12.3335
	(3.0405)
Parents Married	0.6853
	(0.4644)
Father Emp Prev Dec.	0.8485
	(0.3586)
Mother Emp Prev Dec.	0.8299
	(0.3757)
Household Income/10000DKK	62.0223
	(50.7021)
High School in Municipality	0.7241
	(0.4470)
Observations	53256

Mean values shown for 16 year old individuals residing in Denmark in 2002 unless otherwise indicated. Standard deviations in parentheses.

Table 5: High School Participation for Male 16 Year Olds by Immigrant Status

	(1) Native - Any HS Ongoing	(2) Imm/Desc - Any HS Ongoing	(3) Imm/Desc - Any HS Ongoing
% Both Parties GE 2001	-0.012	1.478**	1.483***
	(0.180)	(0.578)	(0.568)
Frac of Own Nat. >= HS	-0.094	0.124	
	(0.096)	(0.151)	
Frac of Own Nat. Emp	0.085	0.476***	
	(0.179)	(0.166)	
Frac of Munc Pop Own Nat.	0.031	-1.073	-1.115
	(0.154)	(0.747)	(0.724)
Mother Years of Education	0.014***	0.010***	0.010***
	(0.001)	(0.003)	(0.003)
Father Years of Education	0.016***	0.006*	0.006*
	(0.001)	(0.003)	(0.003)
Parents Married	0.064***	0.113***	0.113***
	(0.007)	(0.033)	(0.034)
Father Emp Prev Dec.	0.053***	0.073***	0.081***
	(0.009)	(0.028)	(0.028)
Mother Emp Prev Dec.	0.102***	0.067**	0.082***
	(0.009)	(0.026)	(0.025)
Household Income/100000DKK	0.003**	0.012*	0.014**
	(0.001)	(0.006)	(0.006)
% Natives Unemp.	-0.251		
	(0.394)		
% Western Imm Unemp.		-0.086	-0.136
		(0.630)	(0.636)
% Non Western Imm Unemp.		0.112	-0.032
		(0.213)	(0.217)
Population Density (per 1000)	-0.004	0.008	0.009*
	(0.004)	(0.005)	(0.006)
High School in Municipality	0.018**	0.041	0.063
	(0.008)	(0.038)	(0.039)
Country of Origin Dummies?	No	Yes	Yes
R^2	0.064	0.192	0.186
N	25526	1669	1669

Standard errors reported in parentheses clustered at municipality level. * p<0.10, ** p<0.05, *** p<0.01. Any HS Ongoing corresponds to either enrollment in regular high school, business high school, or vocational training programs (apprenticeships).

Table 6: High School Participation for Female 16 Year Olds by Immigrant Status

	(1) Native - Any HS Ongoing	(2) Imm/Desc - Any HS Ongoing	(3) Imm/Desc - Any HS Ongoing
% Both Parties GE 2001	-0.206	0.836	0.869
	(0.184)	(0.582)	(0.590)
Frac of Own Nat. >= HS	-0.262**	-0.066	
	(0.101)	(0.172)	
Frac of Own Nat. Emp	0.162	0.167	
	(0.198)	(0.191)	
Frac of Munc Pop Own Nat.	0.326**	1.811*	1.824*
	(0.133)	(1.028)	(1.029)
Mother Years of Education	0.014***	0.010***	0.010***
	(0.001)	(0.003)	(0.003)
Father Years of Education	0.014***	0.007**	0.007**
	(0.001)	(0.003)	(0.003)
Parents Married	0.066***	0.046	0.045
	(0.008)	(0.039)	(0.038)
Father Emp Prev Dec.	0.076***	0.059**	0.062**
	(0.009)	(0.025)	(0.025)
Mother Emp Prev Dec.	0.111***	0.072***	0.075***
	(0.008)	(0.027)	(0.026)
Household Income/100000DKK	0.006**	0.000	-0.000
	(0.003)	(0.007)	(0.007)
% Natives Unemp.	-0.805**		
	(0.404)		
% Western Imm Unemp.		-1.247**	-1.351**
		(0.595)	(0.589)
% Non Western Imm Unemp.		0.177	0.153
		(0.213)	(0.221)
Population Density (per 1000)	0.003	-0.000	-0.000
	(0.003)	(0.004)	(0.004)
High School in Municipality	0.021**	0.149***	0.154***
	(0.009)	(0.044)	(0.043)
Country of Origin Dummies?	No	Yes	Yes
R^2	0.082	0.236	0.235
N	24528	1533	1533

Standard errors reported in parentheses are clustered at municipality level. * p<0.10, ** p<0.05, *** p<0.01. Any HS Ongoing corresponds to either enrollment in regular high school, business high school, or vocational training programs (apprenticeships).

Appendices

A Robustness Checks

A.1 3 or More Years Since Moved

Table 7: High School Participation for Male 16 Year Olds by Immigrant Status - 3 or More Years Since Moved

	(1) Native - Any HS Ongoing	(2) Imm/Desc - Any HS Ongoing
% Both Parties GE 2001	0.054	1.781**
	(0.192)	(0.718)
Frac of Own Nat. >= HS	-0.068	0.450*
	(0.100)	(0.239)
Frac of Own Nat. Emp	0.036	0.035
	(0.175)	(0.225)
Frac of Munc Pop Own Nat.	0.031	-1.613*
	(0.163)	(0.840)
Parental Education Controls?	Yes	Yes
Household Controls?	Yes	Yes
Municipality Controls?	Yes	Yes
Origin Country Dummies?	No	Yes
R^2	0.052	0.120
N	21861	1276

Standard errors reported in parentheses clustered at municipality level. * p<0.10, ** p<0.05, *** p<0.01. Any HS Ongoing corresponds to either enrollment in regular high school, business high school, or vocational training programs (apprenticeships). Includes same parental education, household, and municipality controls as Table 5.

Table 8: High School Participation for Female 16 Year Olds by Immigrant Status - 3 or More Years Since Moved

	(1) Native - Any HS Ongoing	(2) Imm/Desc - Any HS Ongoing
% Both Parties GE 2001	-0.131	0.594
	(0.190)	(0.567)
Frac of Own Nat. >= HS	-0.234**	0.069
	(0.102)	(0.210)
Frac of Own Nat. Emp	0.097	0.110
	(0.191)	(0.218)
Frac of Munc Pop Own Nat.	0.389***	1.308
	(0.133)	(0.896)
Parental Education Controls?	Yes	Yes
Household Controls?	Yes	Yes
Municipality Controls?	Yes	Yes
Origin Country Dummies?	No	Yes
R^2	0.062	0.153
N	20795	1171

Standard errors reported in parentheses clustered at municipality level. * p<0.10, ** p<0.05, *** p<0.01. Any HS Ongoing corresponds to either enrollment in regular high school, business high school, or vocational training programs (apprenticeships). Includes same parental education, household, and municipality controls as Table 6.

A.2 6 or More Years Since Moved

Table 9: High School Participation for Male 16 Year Olds by Immigrant Status - 6 or More Years Since Moved

	(1) Native - Any HS Ongoing	(2) Imm/Desc - Any HS Ongoing
% Both Parties GE 2001	0.177	2.428***
	(0.184)	(0.880)
Frac of Own Nat. >= HS	-0.003	0.461
	(0.092)	(0.355)
Frac of Own Nat. Emp	-0.106	0.048
	(0.163)	(0.279)
Frac of Munc Pop Own Nat.	0.124	-1.883*
	(0.137)	(1.051)
Parental Education Controls?	Yes	Yes
Household Controls?	Yes	Yes
Municipality Controls?	Yes	Yes
Origin Country Dummies?	No	Yes
R^2	0.045	0.112
N	18259	928

Standard errors reported in parentheses clustered at municipality level. * p<0.10, ** p<0.05, *** p<0.01. Any HS Ongoing corresponds to either enrollment in regular high school, business high school, or vocational training programs (apprenticeships). Includes same parental education, household, and municipality controls as Table 5.

Table 10: High School Participation for Female 16 Year Olds by Immigrant Status - 6 or More Years Since Moved

	(1) Native - Any HS Ongoing	(2) Imm/Desc - Any HS Ongoing
% Both Parties GE 2001	-0.060	0.179
	(0.213)	(0.643)
Frac of Own Nat. >= HS	-0.183	-0.060
	(0.112)	(0.267)
Frac of Own Nat. Emp	0.035	0.121
	(0.212)	(0.281)
Frac of Munc Pop Own Nat.	0.445***	0.879
	(0.166)	(1.034)
Parental Education Controls?	Yes	Yes
Household Controls?	Yes	Yes
Municipality Controls?	Yes	Yes
Origin Country Dummies?	No	Yes
R^2	0.054	0.133
N	17435	853

Standard errors reported in parentheses clustered at municipality level. * p<0.10, ** p<0.05, *** p<0.01. Any HS Ongoing corresponds to either enrollment in regular high school, business high school, or vocational training programs (apprenticeships). Includes same parental education, household, and municipality controls as Table 6.

A.3 3 or More Years Since Immigrated

Table 11: High School Participation for Immigrant/Descendant 16 Year Olds - 3 or More Years Since Immigrated

	(1) Male - Any HS Ongoing	(2) Female - Any HS Ongoing
% Both Parties GE 2001	1.713***	0.881
	(0.625)	(0.561)
Frac of Own Nat. >= HS	0.475**	-0.025
	(0.219)	(0.222)
Frac of Own Nat. Emp	0.117	-0.049
	(0.203)	(0.209)
Frac of Munc Pop Own Nat.	-1.025	1.494
	(0.757)	(0.921)
Parental Education Controls?	Yes	Yes
Household Controls?	Yes	Yes
Municipality Controls?	Yes	Yes
Origin Country Dummies?	Yes	Yes
R^2	0.137	0.156
N	1524	1398

Standard errors reported in parentheses clustered at municipality level. * p<0.10, ** p<0.05, *** p<0.01. Any HS Ongoing corresponds to either enrollment in regular high school, business high school, or vocational training programs (apprenticeships). Includes same parental education, household, and municipality controls as Table 5 and 6.

A.4 6 or More Years Since Immigrated

Table 12: High School Participation for Immigrant/Descendant 16 Year Olds - 6 or More Years Since Immigrated

	(1) Male - Any HS Ongoing	(2) Female - Any HS Ongoing
% Both Parties GE 2001	1.761***	0.629
	(0.620)	(0.524)
Frac of Own Nat. >= HS	0.487**	-0.179
	(0.235)	(0.209)
Frac of Own Nat. Emp	0.052	0.055
	(0.215)	(0.204)
Frac of Munc Pop Own Nat.	-1.109	1.221
	(0.816)	(0.821)
Parental Education Controls?	Yes	Yes
Household Controls?	Yes	Yes
Municipality Controls?	Yes	Yes
Origin Country Dummies?	Yes	Yes
R^2	0.123	0.135
N	1393	1274

Standard errors reported in parentheses clustered at municipality level. * p<0.10, ** p<0.05, *** p<0.01. Any HS Ongoing corresponds to either enrollment in regular high school, business high school, or vocational training programs (apprenticeships). Includes same parental education, household, and municipality controls as Table 5 and 6.

A.5 Immigrants vs. Descendants

Table 13: High School Participation for Immigrants and Descendants

	(1) Immigrant - Any HS Ongoing	(2) Descendant - Any HS Ongoing
% Both Parties GE 2001	1.582***	-0.124
	(0.499)	(0.560)
Frac of Own Nat. >= HS	0.071	-0.046
	(0.111)	(0.268)
Frac of Own Nat. Emp	0.342**	0.300
	(0.134)	(0.242)
Frac of Munc Pop Own Nat.	0.976	0.496
	(1.545)	(0.725)
Male	-0.054**	-0.073**
	(0.024)	(0.029)
Parental Education Controls?	Yes	Yes
Household Controls?	Yes	Yes
Municipality Controls?	Yes	Yes
Origin Country Dummies?	Yes	Yes
R^2	0.234	0.097
N	2037	1165

Standard errors reported in parentheses clustered at municipality level. * p<0.10, ** p<0.05, *** p<0.01. Any HS Ongoing corresponds to either enrollment in regular high school, business high school, or vocational training programs (apprenticeships). Includes same parental education, household, and municipality controls as Table 5 and 6.