Ethnic inequalities in the transition from education to work

A longitudinal analysis of school, college and university graduates

Mats Lillehagen

Department of Sociology and Human Geography

University of Oslo

Gunn Elisabeth Birkelund

Department of Sociology and Human Geography

University of Oslo

RUNNING HEAD: Ethnic inequalities in the transition from education to work

ACKNOWLEDGEMENTS: The authors are grateful for comments from seminar audiences in Philadelphia (RC28) and Hafjell. The data required for this project were made available through the SEGREGATION project funded by the Research Council of Norway (RCN project #202479).

Abstract

Each year, students graduate from schools, colleges and universities. Some find a job quickly - others do not. Delays in the transition from education to work have been associated with scarring effects and detrimental effects on later employment and career progression.

Increasing numbers of graduates from universities and colleges are descendants of immigrants.

The labor market performance of children of immigrants arguably constitutes an important test of the long-term structural integration of ethnic minorities. Using comprehensive

Norwegian administrative data on complete birth cohorts, we apply discrete time hazard regression to examine ethnic inequalities in relative transition rates from education to work, comparing majority graduates to ten groups of immigrant descendants from the 1973 to 1997 birth cohorts (N = 964,450 persons with 1,901,171 person-years). We find clear evidence of ethnic inequalities in transition rates, where children of immigrants or African origin fare the worst. Second, supply side factors do not seem very relevant for ethnic inequalities in the transition from education to work; as the overall patterns mostly remains unaffected when adjusted for factors like educational field, family obligations and parental background. Third, we find that the minority disadvantages are less marked at lower levels of education for some groups.

Introduction

Each school year, students graduate from schools, colleges and universities. Increasing numbers of those who enter the labor market are descendants of immigrants (Schröder, 2010). Most graduates find a job quickly - others do not. Individuals who experience longer time spans than others before they find a job are not only losing out in terms of forgone earnings; studies show that the transition from education to work also matters to their labor market outcomes later in life (Bradley and Nguyen, 2004; Steijn et al., 2006; Eriksson and Rooth, 2014). An unsuccessful transition is associated with substantial negative outcomes, while delays have been associated with scarring effects and detrimental effects on later employment and career progression (Korpi, 1997; Arulampalam et al., 2000; Cockx and Picchio, 2013).

In this study, we examine ethnic inequalities in transition rates from education to work.

Existing research generally provides convincing evidence of ethnic disadvantages in employment rates (Heath et al., 2008; Algan et al., 2010; Crul et al., 2012). Inspired by the general literature on transitions from school to work and early labor market experiences (Wolpin, 1987; Jensen and Westeraard-Nielsen, 1987; Bratberg and Nilsen, 2000), earlier studies, using hazard regression models, have addressed ethnic inequality in transition rates from education to work (Nielsen et al., 2003; Kalter and Kogan, 2006; Brekke, 2007; Tasiran and Tezic, 2007; Vanoverberghe et al., 2008; Gupta and Kroman, 2014; Toma, 2015). A recent study also explores ethnic employment differences, comparing British graduates six months and three years after graduation (Zwysen and Longhi, 2018). A general finding in this literature is that non-western immigrants and their children, especially individuals of African origin, spend longer time in non-employment after they graduate from the educational system.¹

This research is important and well crafted, yet most studies relying on a longitudinal perspective include only a small set of aggregated groups of descendants (such as western/non-western, or world-regions), whereas studies including more detailed ethnic groups lack a proper longitudinal perspective. There is also a need for updated research. In this study, using hazard regression models, we examine relative transition rates from education to work for several more detailed groups of graduates from Norwegian universities, colleges and secondary schools. We utilize detailed individual-based longitudinal information with yearly observations from registry data covering the years 1990-2014 for the 1973-1997 birth cohorts. We classify all descendants of immigrants into ten groups and compare them with the majority population

We first compare the job attainment rate of all graduates from the same cohort in the same year, who have also spent the same amount of years in the labour market since graduating from school. We then examine whether the same patterns hold when adjusting for important supply-side factors related to educational level and field, parental background and family obligations. Furthermore, we analyze ethnic differences in job attainment rate for those who completed lower secondary school, upper secondary education and higher education separately. While some studies indicates that the performance of minority groups compared to the majority varies across educational levels, more comprehensive studies of educational heterogeneity are lacking (but see Gupta and Kromann, 2014). This is an important research question, as factors that potentially affect the job prospects of many minority groups in a negative way, such as reliance on social networks or higher levels of discrimination may differ across segments of the labor market oriented towards specific levels and types of human capital.

We provide clear evidence of ethnic inequalities in relative transition rates. With four exceptions (men with Turkish background and women with Turkish, Vietnamese and Moroccan backgrounds all perform on par with the majority population), all other minority groups are disadvantaged. Adjusting for several important supply side factors such as educational qualifications and family obligations do not significantly affect this overall pattern of substantial minority disadvantage. This interesting finding is consistent with the prevalence of ethnic discrimination, though other explanations are also highly relevant. Additionally, we find that relative transition rates for most of the minority groups do not vary by educational level. Still for some groups, we document a tendency for graduates with lower levels of schooling (especially lower secondary school) to obtain employment faster relative to the majority population, when compared to co-ethnics with longer educations.

We hope to make four important contributions to the literature. First, we include more ethnic groups than previous longitudinal research on relative transition rates. Second, we also include graduates from lower secondary school (many of whom are secondary school dropouts), which add to the knowledge of labor market outcomes of a particular vulnerable group. Third, we include a large number of supply-side variables, such as educational level, educational field, marital status, number of children, and parental background. To our knowledge, this is one of the first studies addressing the importance of fields of education for the labor market transition of descendants of immigrants. Fourth, we study the relative transition rates of individuals from the same minority groups compared to the majority population at different levels of education. Very little previous work has considered this issue.

Why should we expect to find ethnic inequalities in education to work transitions?

In this study we mainly study three important groups of factors that are likely to affect ethnic inequalities in labor market transitions based on previous research and theory: Human capital, family obligations, and parental background.

Human capital

Human capital theory emphasizes the positive causal association between education and work related skills on labor market performance. In the classical formulation, the level and quality of education is directly linked to productivity (Becker, 1993). If there is competition for the good jobs, we might expect the more productive and well educated to find a job earlier than the others do. According to signaling theory however, education works as a screening device for employers, as a signal they use to rank job applicants. An educational diploma gives a positive signal of the applicant's unobserved qualities, such as intelligence, work effort and motivation (E.g. Stiglitz, 1975). Either way, we can expect shorter transition periods for the better educated than others.

Though often downplayed in traditional human capital theory, evidence indicates that field of study also matters for work related outcomes (Kalmijn and Van der Lippe, 1997; Klein, 2010). Different kinds of education provide different specialized skills, relevant for different types of jobs. Klein (2010) suggests that the effect of field of specialization on performance in the labor market is mediated by specificity and selection. The first can be related to the classical formulation of human capital theory, while the second is more congruent with the signaling approach. These factors could contribute to differences in transition rates among individuals with similar levels of education; thus, we include information on individuals' level and field of education. In an additional analysis, we also include information on lower secondary school grades for a slightly smaller sample.

Family obligations

For many young graduates, the period they finish their education overlaps with other life events, such as finding a partner, having children, and taking up loans to buy their first apartment (Bratsberg and Nilsen, 2000). Family obligations affect individuals' labor supply. Compliance with what is commonly referred to as the traditional male breadwinner model may increase men's and reduce women's employment efforts. These norms, which were dominant in many western countries in the 1950-1960s (Parsons and Bales, 1956), prescribe that men should be responsible for providing their family with an income, while women should take the main responsibility for children and housework. Today gender norms have changed and many societies, including Norway, are characterized by dual-income families (Ellingsæter, 1998; Lewis, 2001) yet traditional gender roles are still supported in many immigrant groups (Heath et al., 2008). Studies indicate, though, that adherence to traditional gender norms are weaker among the immigrant descendants (Dale et al., 2006; Lappegård, 2006; Heath and Cheung, 2008; Nadim, 2016). We expect the transition rates from education to work to be influenced by family obligations. Thus, intermediate variables such as marital status and number of children are likely to be associated with transition rates, especially for women. Importantly, differences in family obligations between different ethnic groups could potentially explain group differences in their labor market success.

Parental background

Parental background is related to ethnic differences in labor market outcomes between descendants of immigrants and the majority population (Jonsson, 1987; Fekjær, 2007; Heath et al., 2008; Hermansen, 2013), and we therefore include information on the educational level of parents in our analysis.

To sum up, youths' transition from education to work is likely to be associated with their level and field of education, their school grades, family obligations, and parental background. We will include these factors as control variables in our analyses. Previous research on the transition from education to work have found that adjusting for these factors makes a difference: Nielsen et al. (2003) document that the inclusion of parental education made the disadvantages in waiting time for second-generation immigrants to Denmark somewhat less marked. Tasiran and Tezik (2007) find that the inclusion of educational level of the individual as well as for the parents reduces disadvantages for some groups of second-generation immigrants in Sweden, but that significant disadvantages remain in most cases. Toma (2015) includes a broader set of variables, more similar to the ones used here, and find that educational level, social background and having a spouse and children reduces some of the disadvantages in the timing of the school to work transition for descendants of immigrants in France. Also, Gupta and Kroman (2014) uses propensity score matching and find that educational level, parental characteristics as well as characteristics of the local labor market reduces and in some cases reverses the disadvantages in the arrival rate of job offers for second generation immigrants in Denmark.

Demand-side factors, such as employers treating job applicants with similar characteristics differently, are also likely to be relevant. Unfortunately, we are not able to measure labor market discrimination given our data, yet we will get back to this interpretation in the discussion.

The Norwegian context

Modern immigration history into Norway started in the 1970. Since then, the immigrant population has grown steadily, from 1.5 per cent in the 1970, 11.4 per cent in 2010, to 16.8 percent of the population in 2017 (Statistics Norway, 2017). Though not a full member of the

European Union, Norway has experienced a large influx of Polish immigrant workers after the EU25 enlargement. This is because Norway is a member of the European Economic Area Agreement, and therefore a participant in the free market inside the EU. Thus, Poles have become the largest migrant group. From non-western countries the largest immigrant groups today are the Iraqis and the Somalis, whereas the Pakistanis are the most established non-western group, with the largest group of immigrant descendants; i.e., Norwegians born to immigrant parents (Andreassen and Dzamarija, 2011).

The employment rate for immigrants from the European Union, including eastern Europeans, and other western countries, are on par with the overall rate, but immigrants from non-western countries have lower labor market participation; particularly Somalis, Iraqis and Afghanis. In some groups, such as Pakistanis and Somalis, there are also large gender gaps in employment (Olsen, 2011). Field experiments have documented hiring discrimination against immigrant descendants with Pakistani/Muslim names in the labor market (Birkelund et al., 2017; Midtbøen, 2014). Still, attitudinal studies, such as the European Social Surveys, show that compared to other Europeans, Norwegians are relatively liberal and tolerant towards the immigrant population (Blom, 2011).

FIGURE 1 ABOUT HERE

Figure 1 indicates that the unemployment rate has generally declined throughout the period we study (1990-2014), but that it has stayed comparatively low. The rate peaked at around six per cent during the early nineties before stabilizing at around 3.5 per cent in the early 2000s with some fluctuations. Due to the country's oil and gas revenues, the global recession in 2008 was less severe in Norway. Thus, compared to other European countries, the Norwegian labor market has been relatively tight, which in general terms should indicate a comparatively smooth transition from education to work for the newly graduated.

Data

We utilize panel data on individuals from Statistics Norway's comprehensive registries, which are linked using a unique and non-identifiable ID number for each person. Our data includes information on 24 birth cohorts, i.e. individuals born between 1973 and 1997, who completed their education (at different levels) in the period 1990–2014. In each cohort, we include all children of immigrants as well as the complete majority population. Our data includes 1,901,171 person-years (964,450 persons) and extends to observations in 2014, so we can measure whether people graduating in 2013 were employed in 2014 at the latest.

Definitions of variables

Employment: We combine information about annual employment status and income to define employment, and we have set a relatively low earnings threshold for annual employment: We define all individuals with earnings equal to or above twice the (consumer price adjusted) National Insurance Basic Amount ² as employed. In 2010, this corresponded to an annual income of about NOK 150,000, which is about 17.000 Euro. We also estimated the results with a lower threshold (1G) with very similar findings (Figures A1 and A2, Appendix).

Country/region of origin: We differentiate between descendants with parents originating in five countries of origin: Morocco, Vietnam, Turkey, India and Pakistan. The other groups are smaller, and we merged them into five regions: Europe and the West, Africa (excluding Morocco), Asia (excluding Vietnam, India and Pakistan; including Oceania), The Middle East (excluding Turkey), and Latin America. The majority is coded zero as the reference category.

Education: The data include detailed educational information from the National Education Database (NUDB). *Educational level* is coded as a set of dummy variables with the categories a) Completed lower secondary school b) Completed upper secondary education; c) Higher

education (all courses at University/college level, including also BA and MA/PhD). Lower secondary education is mandatory in the Norwegian educational system and covers grades 8-10. Upper secondary education generally consists of three years of study. Upper secondary school is not mandatory, though within each birth cohort, the vast majority enter upper secondary school. Higher degrees at colleges and universities conform to European standards (three-year Bachelor degree, five-year Master degree). *Field of education* is included as a set of dummies for humanistic and esthetical subjects; teaching and pedagogy; social sciences and law; economy and administration; science, crafts and technical subjects; health, social subjects and sports; agriculture, hunting and fishing; transportation, safety and service, and others, with general subjects as the reference category. These categories cover all parts of the Norwegian education system, but some of them are only relevant at higher levels of the educational system. A continuous measure of average lower secondary school grades is also included in an additional analysis (Figure A5 appendix) in order to capture additional facets of individual *skill level* (c.f Miller, 1998; Gracia et al., 2016).

Social background is measured by *parental education* when the child was 16 years old. We use information on father's education and only include mother's education if fathers' is not available. This variable is included as a set of dummies with the following categories: Lower secondary education (reference category), upper secondary education, short higher education and long higher education.

Family obligations: Married is coded as 1, with unmarried/others as reference category. We include dummies for number of children: No children (reference category); one child; and, two or more children.

We also include the following control variables in all models. *Age*: Year of birth is included as a set of dummies, with 1973 as reference category. *Historical time*: Due to economic

fluctuations over time, we include dummies for each year, from 1990 to 2014, with 1990 as the reference category. *Duration* refers to time at risk; i.e. the time between a person's graduation and until he/she finds a job. To allow for curvilinear patterns, we include both a first order and a second order factor of duration.

Analytical approach

We apply discrete-time hazard regression (Cleves et al., 2002); a standard method for investigating transition rates. Each person is represented by x number of person years, which constitutes the unit of analysis. In our models, person-years refers to the number of years in which a person is *at risk* of gaining employment. In our preferred model every year from and including the year when the individual obtained his or her highest educational level (Lower secondary, upper secondary or higher education) is included, excluding years in which the person pursued full-time education, resided abroad, or gave birth to a child.

Some individuals might be unable to find employment after they finished their education at a given level, and may therefore decide to return to the educational system. If there are group differences in this behavior, the exclusion of person-years between different levels of educations might bias the country/region of origin estimates (see also Neal and Johnson, 1996; Urban, 2012). In an alternative specification, we therefore included years spent without employment between educational levels by counting all years since completing lower secondary school as years under risk (again excluding years spent in full time education, residing abroad or giving birth to a child). This makes very little difference to the main results (See figures A3 and A4 in the appendix).

As we use the complementary logistical log function, we can interpret coefficient estimates as changes in *relative rates*. By raising Euler's constant to the coefficient of the X-variable, we

obtain the percentage increase in the relative transition rate from education to employment, given that the X-variable increased by one value. We use cluster-robust standard errors to correct for correlations resulting from the fact that many individuals are represented with several observations in the data (person-years).

We perform all analyses separately for women and men, and we estimate three main models. In all models, we control for individual year of birth and historical time, as well as duration and duration-squared. Model 1 show the transition rates to employment for the minority groups compared with the majority population. Model 2 includes human capital variables (level and field of education) as well as parental education.³ Model 3 also includes family related variables (marital status and number of children). Interactions between all variables and the main groups were also tested (available on request), but they did not significantly affect the main results.

Results

We present our results in two parts. First, we provide descriptive statistics for the transition process by country/region of origin. We report the overall unadjusted transition rate as well as the timing of successful transitions (see Table 1). Secondly, we describe the results of the three main models of the event history analyses (figure 2). Third, we present results from the analysis of heterogeneity in transition rates by educational level (figure 3).

TABLE 1 ABOUT HERE

We begin by looking at group differences in the transition to work. The second row of Table 1 shows the proportion of person-years ending in a transition to employment. We note that transition percentages vary across the groups. For female and male natives the percentage of person-years in which a transition takes place is 43.19 and 43.98 respectively. The lowest

transition percentages for each gender are found for male children of African immigrants (22.26 per cent) and female children of immigrants originating in The Middle-East (26.41 per cent). Second, for all minority groups a higher average share of *individuals* are without work (right censored) at the end of the period compared to the majority (see Table 1, sixth row). 14.8 per cent of majority women and 13.62 per cent of majority men are right-censored. Men of African descent (53.02 per cent) and females of Middle-Eastern descent (48.81 per cent) display the largest disadvantages, while women and men of Pakistani descent are closest to the majority, with 21.86 and 21.02 per cent being right-censored respectively.

A third point concerns the timing of successful transitions into employment. In the last three rows of Table 1 we have plotted the percentage who transitioned in the first year after graduating, the second year and the third year or later, *for the individuals who obtained work* during the observation period. We note that for all groups, transitions to employment are most likely to occur in the first year after graduation and then become less likely for each subsequent year without work. About 58 percent of the individuals of the majority population who are not right-censored obtain employment during their first year under risk. Compared to the majority, obtaining employment in the first year is less likely to happen for most minority groups. However, female children of immigrants from Vietnam and India are slightly more likely to obtain employment during their first year under risk compared to the majority population.

To summarize our discussion so far, most minority groups seem to be disadvantaged in two related ways. Children of immigrants from most of the groups included are less likely to be employed overall, and in the cases where they obtain employment, the transition is delayed compared to the majority population. Some of these observed disparities might be due to differences in year of birth, when they were outside the educational system and for how long

(historical time and duration), level and field of education, parental characteristics, and their family situation. We document the full distribution of these variables for each group in table A1a and A1b in the appendix, and these numbers display a substantial variation between the groups. To address the consequences of adjusting for these factors we now present the results from three regression models based on discrete time hazard regressions. Figure 2 provides the relevant results for men and women separately. Details on individual coefficients are found in Table A2 in the appendix.

FIGURE 2 ABOUT HERE

Model 1 includes country/region of origin, with controls for age, year and duration. The results confirm our previous findings of slower relative rates of transition for all minority groups with the exception of female children of Turkish, Vietnamese and Moroccan immigrants, as well as male children of Turkish immigrants, all of which perform on par with the majority. The relative rate for the remaining groups varies between roughly 50 and 80 per cent of that of the majority. Again, we see that male and female children of African immigrants display the lowest relative transition rate.

In Model 2, we also include individuals' level and field of education, as well as the parental educational level. The inclusion of these variables leads to the reduction of some of the disadvantages, but this *change* is only statistically significant in one case: The relative transition rate of male children of immigrants from Pakistan is significantly larger in this model, reflecting disadvantages in their educational attainment and social origin compared to the majority. The relative transition rate for males of Turkish descent no longer indicates a statistically significant disadvantage when these factors are adjusted for. Perhaps surprisingly, in this model, women of Moroccan descendants experience a slightly higher rate of transition compared to the majority.

In Model 3, we also include measures of marital status and number of children. For both men and women, these variables have only minor impact on the relative transition rates. While it makes very little difference for men overall, the inclusion of these variables does lead to a lower relative rate compared to that estimated in the second model for females, but the change is not statistically significant for any of the groups. While the changes in the coefficients for the countries and regions from model 2 to 3 are not statistically significant, it is worth noting that male children of Pakistani immigrants as well as female children of Vietnamese immigrants no longer perform on par with the majority (as indicated in model 2) when controls for the family situation are included. Overall, the pattern presented Figure 2 are in many ways very similar to the conclusions drawn based on the findings presented in table 1, though the adjustments affect the relative disadvantages of some groups.

FIGURE 3 ABOUT HERE

As noted above, the transition rate for the minority groups relative to the majority is likely to vary with qualifications. We therefore estimated the coefficients for each country/region of origin separately at each educational level (Figure 3). We first consider whether the relative transition rate varies between educational levels for each minority group, and then look more closely at the disadvantages - or advantages - in the relative transition rates associated with each level of education for each group.

For eight out of ten groups of male descendants (children of immigrants from Pakistan, India, Vietnam, Morocco, The Middle-East, Latin-America, Asia and Africa) and six out of ten groups for the women (children of immigrants from India, Vietnam, Morocco, Latin-America, Asia and Africa) the differences in the relative transition rates do not vary significantly by educational levels, as indicated by overlapping confidence intervals. These results indicate the

same relative disadvantage at all three levels of education (while taking the potential for type 2 errors into account).

For the remaining groups the most common, statistically significant finding is that children of immigrants who have only completed lower secondary education generally have higher transition rates compared to one of or both the other two educational levels. Three main patterns can be discerned. First, for female children of Pakistani and Turkish immigrants, graduates from lower secondary education have the highest overall transition rates. In the second pattern, graduates from lower secondary education transition faster relative to the majority compared to those who have completed upper secondary, but on par with individuals who have completed higher education. This is the case for women of Middle-Eastern descent, and men of Turkish descent. Third, for some minority groups, graduates from lower secondary education experience a higher rate of transition compared to graduates from higher education, but perform on par with graduates from upper secondary education. This is the case for both female and male children of European immigrants. However, in the case of males with this background, those who have upper secondary education as their highest educational level obtain work faster than graduates from higher education do. For females of European descent, graduates from upper secondary education perform on par with the two other educational groups.

Figure 3 also indicates that some sub-groups obtain employment on par with or faster than the majority population with the same educational qualifications, thereby providing a more detailed picture compared to that presented in figure 2. Several sub-groups perform on par with the majority population. For men, this is the case for children of immigrants from Pakistan (lower secondary education), India (lower and upper secondary education), Turkey (lower secondary and higher education), Morocco (upper secondary and higher education),

Middle-East (all levels), Latin-America (upper secondary education) and Europe (lower and upper secondary education). Male children of immigrants originating in Vietnam, Asia and Africa are disadvantaged at all educational levels. For women, children of immigrants from Pakistan (lower secondary), India (lower secondary), Turkey (higher education), Vietnam (lower and upper secondary), Morocco (upper secondary and higher education), Middle-East (lower secondary), Latin-America (higher education), Asia (lower secondary), Africa (lower secondary) and Europe (lower secondary) display transition rates that are not significantly different from that of the majority. Females of Turkish and Moroccan descent, who have completed lower secondary as their highest education, actually display faster transition rates compared to individuals of the majority with similar educational qualifications. Thus, a clear overall pattern is that minority groups at the two lowest levels of education are more likely to transition to the labor market on par with or even faster than the majority, though the latter is rare. However, it is important to keep in mind that when we analyze smaller sub-groups in this way the standard errors, and the chance of making type 2-errors, increases. In this case, a type 2 error would imply that we are unable to detect an existing difference, most probably a minority disadvantage, due to the low number of observations in each sub group. The evidence reviewed in this paragraph should therefore be treated as preliminary.

Discussion

The findings presented in this paper are based on a comparison of second-generation immigrants and native Norwegian born 1973-1997, who graduated from schools, colleges and universities and entered the labor market between 1990 and 2013. We have provided new and important insight into the critical transition between the labor market and the job market. Importantly, we have expanded upon previous research by including a larger set of country- and region- based groupings. We have also analyzed each group separately at different levels

of educational attainment. Consistent with the findings in previous research, we found clear evidence of disadvantages in the relative transition rates for almost all minority groups, especially those of non-western descent. Although the transition rates did not differ by level of education for the most of the groups, some minority groups displayed a tendency for higher relative rates at lower levels of education. Our more detailed results show the following:

Africa, The Middle-East and Latin-America: Previous research has documented that clearest minority disadvantages in the rate of transition from school to work for immigrants and descendants of immigrants originating in non-western countries (Vanoverberghe et al., 2008; Gupta and Kromann, 2014); the regions Africa, Latin-America and The Middle East (Tasiran and Tezik, 2007), as well as for Maghreb and Africa south of Sahara (Toma, 2015). In congruence with this evidence, we find that descendants of immigrants originating in Africa, The Middle-East and Latin-America are all disadvantaged compared to the majority population. We also document that children of immigrants from the African region have the lowest relative rate overall for both genders, which is consistent with the last two studies. On the other hand, we find that female descendants of Moroccan immigrants obtain employment faster than the majority; which is not consistent with general evidence for children of African immigrants in Sweden (Taziran and Tezic, 2007), but in line with findings for Moroccan first-generation immigrants in Belgium and Spain (Kalter and Kogan, 2006).

Europe: We also document some disadvantages for second-generation immigrants from Europe, while Vanoverberghe et al. (2008) and Tasiran and Tezik (2007) find no such disparity for ethnic minorities in Flanders and Sweden respectively. However, Gupta and Kromann (2014) also find some disadvantage for second-generation western immigrants to Denmark, and Toma (2015) documents a disadvantage for men of South-European origin in France.

Asia: Toma (2015) also provides evidence for slower transitions to employment for children of immigrants from South-East Asia on the regional level compared to the French majority population. Our findings are partially consistent with this. We document disadvantages for both male and female children of immigrants from Asia, as well as male children of Vietnamese immigrants. On the other hand, female children of Vietnamese immigrants perform on par with the majority.

How can we explain these disparities? We have included information on individual educational level and - field, parental education, marital status and number of children as intermediate variables, to see if these variables effect the original association between immigrant status and the relative transition rates. We found that the intermediate variables reduced the disadvantages somewhat, yet made almost no difference to the overall results.⁴

When supply side factors, such as human capital, parental background and family responsibility, seem to be of relatively little relevance, future research on relative transition rates from education to work would probably benefit from inclusion of demand side factors, related to characteristics of employers and firms, labor market structure, etc. Our results are clearly consistent with the existence of labor market discrimination of ethnic minority groups in job hiring processes. Previous field experiments have documented discrimination of second generation Pakistani-Norwegians (Midtbøen, 2014; Birkelund et al., 2017), and it is therefore reasonable to believe that employer discrimination could explain at least some of the remaining disadvantages of minority groups in their relative transition rates (see also Booth et al., 2012; Connor and Koenig, 2015). In addition, differential access to and quality of social networks could also be relevant for the topic explores here (Schröder, 2010).

We have emphasized the importance of looking at factors on the demand side in future studies, yet there might also be other relevant supply side factors that we have been unable to include, such as differences in motivation, search behavior, or preferences.

Another issue in our analytical design is endogeneity. Most of the intermediate factors included here are likely to be affected by such problems. For example, having a child and getting married or choosing to return to the educational system could be affected by one's success in the labor market, implying reverse causality. We attempt to shed some light on this issue by including a measure of school grades in an additional analysis.

Figure A5 in Appendix provide results from two models; a reference model similar to model 1 in figure 2, and another model that also includes information about individuals' *grades* when they finished lower secondary school (available only for a subset of our main sample – most individuals from the 1984-1997 cohorts). Students usually complete lower secondary school when they are 16 years old, so the grades should be unaffected by their future experiences in the labor market, thus - to some degree - mitigating problems related to reverse causality as well as certain types of endogeneity, such as correlated unobservable characteristics (Neal and Johnson, 1996).⁵ These results provide some evidence indicating that early educational performance and correlated unobservable characteristics do not account for the group differences in relative transition rates. Again, the main conclusion seems to point towards the demand side of the labor market.

Less ethnic disadvantage at lower levels of education: The second part of our analysis looked at whether the disadvantages we have documented for most minorities varied with their educational attainment. Our analyses indicated that minority disadvantages were in some cases less marked at lower levels of education, though for most of the minority groups there were no significant differences in relative rates between the different educational levels.

While previous research on this topic is sparse, Gupta and Kromann (2014) find that the disadvantages in the arrival rate of job offers for second generation immigrants in Denmark are less marked for those with lower levels of education (primary school and secondary/high school). In fact, they find that minority women with primary school as their highest level of qualifications are advantaged compared to the majority. The findings of Støren et al. (2009) based on Norwegian data are also relevant here. They look at the probability of being employed in a specific year. They study non-western immigrants and children of immigrants with low levels of education, i.e. from lower secondary to completed upper secondary, and find that the disadvantage in employment for non-western immigrants is less marked at lower levels of education.

Several explanations can potentially account for these findings, and we will suggest three. First, they may be a result of negative selection of natives at the lower educational levels. That is, natives could be more negatively selected in terms of health or other characteristics compared to minority individuals in the same situation (Støren, 2009). Second, the results could also be due to a different kind of selection mechanism, where the minorities who are least successful in the labor market chose to return to the educational system (Urban, 2012). As reported in figures A3 and A4 in the appendix we have also tested models where we instead of relying on information on individuals' highest educational level (our preferred measure) include all years they were under risk for finding employment, including years when they were between different educational levels. We found that this made little difference to our overall results. Third, the mechanisms that are relevant for the job opportunities of ethnic minorities might operate in different ways in different parts of the labor market. For example, discrimination could play a less important role if employers find few job applicants who are willing to work, for instance in low skilled jobs in service and manufacture.

While we have provided robust evidence for an overall disadvantage for minorities and for some variations by educational level, several limitations remain. First, we have information on a yearly basis, thus masking potentially group differences on a finer temporal level. Second, the registry data do not provide information on important labor supply mechanisms, such as work commitment (Gorinas, 2014). Another important limitation concern the issue of causality. In our main analyses, we introduce intermediate variables that might shed light on potential group disparities in relative transition rates. This strategy has been descriptively important and useful for testing hypotheses about possible reasons for ethnic disadvantages. However, these variables may introduce forms of endogeneity, thus making causal interpretations difficult. We have made some headway by introducing high school grades, which is arguably less prone to such problems. Still, our results should not be interpreted as causal findings, and other types of research designs would be highly useful to complement existing studies.

References

- Algan, Y., Dustmann, C., Glitz, A., and Manning, A. (2010). The economic situation of first and second-generation immigrants in France, Germany and the United Kingdom. *The Economic Journal*, **120**, 4-30.
- Andreassen, K.K. and Dzamarija, M.T. Population, in K. Henriksen, L. Østby and D. Ellingsen (Eds.). (2010) *Immigration and Immigrants 2010, Statistical Analyses*. Oslo: Statistics Norway, 15–46.
- Arulampalam, W. Booth, A. and M. Taylor (2000). Unemployment persistence, *Oxford Economic Papers*, **52**, 24-50.
- Becker, G. S. (1993). *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education*. Chicago: The University of Chicago Press.
- Blom, S. (2011) Comparison of attitudes in Norway and other European countries. In K. Henriksen; L. Østby and D. Ellingsen (Eds.), *Immigration and immigrants* (pp 151-167). Oslo: Statistics Norway.
- Birkelund, G. E.; Heggebø, K.; Rogstad, J. (2017). Additive or Multiplicative Disadvantage? The Scarring Effects of Unemployment for Ethnic Minorities, *European Sociological Review*, **33**, 17–29.
- Bradley, S., and Nguyen, A. N. (2004). The school to work transition. In G. Johnes and J. Johnes (Eds), *International handbook of education economics* (pp 484-521). Cheltenham: Edward Elgar.
- Bratsberg, E. and Nilsen, O. A. (2000). Transitions from school to work and the early labour market experience, *Oxford Bulletin of Economics and Statistics*, **62**, 909-929.
- Brekke, I. (2007). Ethnic Background and the Transition from Education to Work among University Graduates, *Journal of Ethnic and Migration Studies*, **33**, 1299–1321.

- Booth, A. L., Leigh, A., and Varganova, E. (2012). Does ethnic discrimination vary across minority groups? Evidence from a field experiment, *Oxford Bulletin of Economics and Statistics*, **74**, 547-573.
- Cleves, M., Gould, W. and Gutierrez, R. 2002. *An Introduction to Survival Analysis Using Stata*. College Station, TX: Stata Press.
- Cockx, B., and Picchio, M. (2013). Scarring effects of remaining unemployed for long-term unemployed school-leavers, *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, **176**, 951-980.
- Connor, P., and Koenig, M. (2015). Explaining the Muslim employment gap in Western Europe: Individual-level effects and ethno-religious penalties, *Social Science Research*, **49**, 191-201.
- Crul, M., J. Schneider, and F. Lelie (Eds.) (2012). *The European Second Generation Compared: Does the Integration Context Matter?* Amsterdam: Amsterdam University Press.
- Dale, A., J. Lindley and Dex, S. (2006). A Life-course Perspective on Ethnic Differences in Women's Economic Activity in Britain, *European Sociological Review*, **22**, 323–337.
- Ellingsæter, A. L. (1998). Dual breadwinner societies: Provider models in the Scandinavian welfare states, *Acta Sociologica*, **41**, 59-73
- Eriksson, S. and Rooth, D.O. (2014) Do Employers Use Unemployment as a Sorting Criterion When Hiring? Evidence from a Field Experiment, *American Economic Review*, **104**, 1014-1039.
- Fekjær, S. N. (2007). New differences, old explanations: Can educational differences between ethnic groups in Norway be explained by social background? *Ethnicities*, **7**, 367-389.

- Gorinas, C. (2014). Ethnic identity, majority norms, and the native–immigrant employment gap, *Journal of Population Economics*, **27**, 225-250.
- Gracia, P., Vázquez-Quesada, L., and Van de Werfhorst, H. G. (2016). Ethnic penalties? The role of human capital and social origins in labour market outcomes of second-generation Moroccans and Turks in the Netherlands, *Journal of Ethnic and Migration Studies*, **42**, 69-87
- Gupta, N. D., and Kromann, L. (2014). *Differences in the labor market entry of second-generation immigrants and ethnic Danes*, IZA Journal of Migration, **3**, no.16.
- Heath, A.F. and Cheung, S. Y. (Eds.) (2007) *Unequal Chances: Ethnic Minorities in Western Labour Markets*. Oxford: British Academy / Oxford University Press.
- Heath, A., Rethon, C. and Kilpi, E. (2008) The Second Generation in Western Europe: Education, Unemployment, and Occupational Attainment, *Annual Review of Sociology*, **34**, 211–35.
- Hermansen, A. S. (2013) Occupational Attainment among Children of Immigrants in Norway: Bottlenecks into Employment – Equal Access to Advantaged Positions? *European Sociological Review*, **29**, 517–534.
- Jensen, P. and Westergaard-Nielsen, N.C. (1987) A Search Model Applied to the Transition from Education to Work, *Review of Economic Studies*, **54**, 461-72.
- Jonsson, J.O. (1987) Class Origin, Cultural Origin and Educational Attainment. The Case of Sweden, *European Sociological Review*, **3**, 229-242.
- Kalmijn, M. and van der Lippe, T. (1997). Type of Schooling and Sex Differences in Earnings in the Netherlands, *European Sociological Review*, **13**, 1-15.
- Kalter, F., and Kogan, I. (2006). Ethnic inequalities at the transition from school to work in Belgium and Spain: Discrimination or self-exclusion? *Research in Social Stratification and Mobility*, **24**, 259-274.

- Klein, M (2010). Mechanisms for the Effect of Field of Study on the Transition from Higher Education to Work, *Mannheimer Zentrum für Europäische Sozialforschung* Arbeitspapiere nr. 130.
- Korpi, T. (1997). Is utility related to employment status? Employment, unemployment, labor market policies and subjective well-being among Swedish youth, *Labour Economics*, **4**, 125-147.
- Lappegård, T. (2006). Family Formation and Education among Pakistani, Turkish and Vietnamese Women in Norway, *GENUS*, **62**, 75-95.
- Lewis, J (2001). The decline of the male breadwinner model: Implications for work and care, *Social Politics: International Studies in Gender, State and Society*, **8**, 152–169.
- Midtbøen, A. H. (2014). Discrimination of the second generation: Evidence from a field experiment in Norway, *Journal of International Migration and Integration*, **17**, 253-272
- Miller, S. R. (1998). High school grades as a signal of human capital. *Educational Evaluation and Policy Analysis*, **20**, 299-311.
- Nadim, M. (2016). Undermining the male breadwinner ideal? Understandings of women's paid work among second-generation immigrants in Norway, *Sociology*, **50**, 109-124.
- Neal, D. A., and Johnson, W. R. (1996). The role of premarket factors in black-white wage differences. *Journal of political Economy*, **104**, 869-895
- Nielsen, H. S., Rosholm, M., Smith, N., and Husted, L. (2003). The school-to-work transition of 2nd generation immigrants in Denmark, *Journal of Population Economics*, **16**, 755-786.
- Olsen, B. (2011) Labour. In K. Henriksen; L. Østby and D. Ellingsen (Eds.). *Immigration and immigrants* (pp 77-102). Oslo: Statistics Norway.

Parsons, T. and R. F. Bales (1956). *Family Socialization and Interaction Process*. London: Routledge Press.

Schröder, L. (2010) (OECD) Labour Market Characteristics and their Impact on the Integration of Immigrant Offspring. In *Equal Opportunities: The Labour Market Integration of the Children of Immigrants* (pp 129–160). Paris: OECD publishing.

Steijn, B., Need, A., and Gesthuizen, M. (2006). Well begun, half done? Long-term effects of labour market entry in the Netherlands, 1950-2000, *Work, Employment and Society*, **20**, 453-472.

Stiglitz, J. E. (1975). The Theory of "Screening", Education, and the Distribution of Income, *American Economic Review*, **65**, 283–300.

Støren, L. A., Opheim, V., and Helland, H. (2009). Getting through closed doors? Labour market entry among ethnic minority and majority youth with low levels of formal education, *Journal of Education and Work*, **22**, 261-282.

Statistics Norway 2017. [Immigrant Statistics for Norway] URL: <https://www.ssb.no/befolkning/statistikker/innvbf>

Tasiran, A., and Tezic, K. (2007). Early labour-market experiences of second-generation immigrants in Sweden, *Applied economics*, **39**, 809-824.

Toma, S. (2015). The School-to-Work Transitions of Second Generation Immigrants in France, *International Journal of Migration and Border Studies*, **1**, 372-397.

Urban, S. (2012). “University Education as a Compensation Strategy Among Second-Generation Immigrants”, *International Migration Review*, **46**, 919-940.

Vanoverberghe, J., Verhaest, D., Verhofstadt, E., and Omey, E. (2008). The transition from school to work in Flanders: a duration analysis, *Journal of education and work*, **21**, 317-331.

Wolpin, K.I. (1987) Estimating a Structural Search Model: The Transition from School to Work, *Econometrica*, **55**, 801-17.

Zwysen, W. and Longhi, S. (2018) Employment and earning differences in the early career of ethnic minority British graduates: the importance of university career, parental background and area characteristics, *Journal of Ethnic and Migration Studies*, **44**, 154

Figures and Tables (main text):**Table 1** Summary statistics for the transition from education to work, by country/region and sex

Variables	Norway		Europe		Africa ^a		Asia ^b		Middle-East ^c		Latin-America	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
<i>Person-years</i>												
Number of person-years	892,581	965,840	3,680	3,905	1,124	1,469	1,426	1,712	728	977	910	1,097
Transition (%)	43.19	43.98	34.13	33.39	27.94	22.26	30.93	28.91	26.1	26.41	28.46	28.35
<i>Persons</i>												
Number of individuals	480,780	517,396	1,879	2,022	628	757	848	1,017	445	551	445	507
Right-censored (%)	14.81	13.62	28.72	44.42	44.42	53.02	42.13	45.54	52.85	48.81	35.73	34.11
First year transition (%) ^d	58.44	58.48	52.55	52.68	48.09	47.09	55.1	54.14	56.32	51.16	39.38	44.69
Second year transition (%)	23.6	21.3	25.32	22.47	28.34	20.18	22.68	22.83	26.32	26.36	34.75	21.86
Third year or later transition (%)	17.96	20.22	22.13	24.85	23.57	32.72	22.22	23.03	17.37	22.48	25.87	33.44

Notes: ^a Excluding Morocco ^b Excluding Vietnam, India and Pakistan ^c Excluding Turkey

^d Yearly transition percentages are calculated only for individuals who obtained employment in the observation period.

Source: Authors' own calculations based on Norwegian administrative registers

Table 1 Continued Summary statistics for the transition from education to work, by country/region and sex

Variables	Morocco		Vietnam		Turkey		India		Pakistan	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
<i>Person-years</i>										
Number of person-years	466	567	1,107	1,299	908	1,011	555	568	2,880	3,287
Transition (%)	40.92	29.2	41.18	32.49	34.7	33.7	38.88	35.95	32.33	33.99
<i>Individuals</i>										
Number of individuals	466	567	1108	992	793	677	414	382	2767	2374
Right-censored (%) ^d	22.12	29.8	30.47	36.2	23.65	26.92	26.31	25.68	21.86	21.02
First year transition (%)	54.44	47.48	60.2	52.24	48.77	48.93	63.52	53.51	46.55	48.8
Second year transition (%)	26.92	20.95	23.99	23.35	22.39	21.91	18.37	22.86	24.95	21.32
Third year or later transition (%)	18.64	31.56	15.8	24.41	28.83	29.16	18.11	23.64	28.5	29.88

Notes: ^a Excluding Morocco ^b Excluding Vietnam, India and Pakistan ^c Excluding Turkey

^d Yearly transition percentages are calculated only for individuals who obtained employment in the observation period.

Source: Authors' own calculations based on Norwegian administrative registers

Figure 1 Unemployment rate 1990-2014. Percent

Notes: Calculations based on those who were in the labor force in each given year.

Source Statistics Norway. Workforce statistics available at:

<https://www.ssb.no/statbank/list/aku?rxid=5a1e6a78-9e9f-43cc-93c8-db6d1a745807>

Figure 2 Relative rate of transition from education to work for male and female minorities compared to the majority. Discrete time hazard regression models

Notes: The vertical line indicates a relative rate of 1, i.e. the same rate as the majority population. Error bars at 95 per cent confidence level. Model 1 includes individual year of birth, historical time, duration and duration-squared. Model 2 includes the following intermediate variables: level and field of education and parental education. Model 3 also includes marital status and number of children. Africa excluding Morocco. Asia excluding Vietnam, India and Pakistan. Middle East excluding Turkey

Source: Authors' own calculations based on Norwegian registries

Figure 3 Relative rate of transition from education to work for male and female minorities compared to the majority, by educational level. Discrete time hazard regression models

Notes: The vertical line indicates a relative rate of 1, i.e. the same rate as the majority population. Error bars at 95 per cent confidence level. Africa excluding Morocco. Asia excluding Vietnam, India and Pakistan. Middle East excluding Turkey.

Source: Authors' own calculations based on Norwegian administrative registers

Appendix

Table A1a Summary statistics for the main independent variables, by country/region. Women.

Variables				
<i>Country/region of origin</i>	Norway	Europe	Africa ^a	Asia ^b
<i>Timing</i>				
Year of Birth – Mean (SD)	1983 (6.07)	1985 (6.5)	1989 (4.9)	1988 (4.80)
Historical Time ^d – Mean (SD)	2005.0 (5.72)	2007.4 (5.73)	2010.4 (3.77)	2010.2 (3.80)
Duration – Mean (SD)	2.47 (2.51)	2.49 (2.35)	2.04 (1.47)	2.03 (1.60)
<i>Educational Level</i>				
Lower secondary (%)	36.06	38.51	52.94	38.01
Completed Secondary (%)	31.51	32.88	24.56	30.22
Higher Education (%)	32.42	28.61	22.51	31.77
<i>Field of Education</i>				
General Studies (%)	48.82	55.98	68.42	57.22
Humanistic and Esthetical (%)	8.10	10.68	3.47	6.45
Teaching and Pedagogy (%)	5.90	2.34	0.53	1.47
Social Science and Law (%)	4.19	4.84	4.98	4.35
Economics and Administration (%)	8.47	8.75	8.63	7.71
Science, Crafts and Technical (%)	4.36	2.99	1.78	6.10
Health, Social and Sports (%)	16.54	11.60	10.94	13.96
Agriculture and Fishing (%)	1.23	0.65	0.00	0.14
Transportation and Service (%)	2.21	2.01	0.89	2.52
Others (%)	0.19	0.16	0.36	0.07
<i>Parental Education</i>				
Lower secondary (%)	28.46	28.79	36.18	35.09
Completed Secondary (%)	50.52	31.58	37.34	30.89
Higher Education (%)	14.3	20.56	15.62	23.58
Missing (%)	6.72	19.07	10.86	10.44
<i>Family</i>				
Married (%)	5.82	5.63	2.67	6.94
No children (%)	80.37	89.24	92.17	93.83
One Child(%)	11.62	5.33	6.67	4.42
Two or More Children(%)	8.01	5.43	1.16	1.75
Number of observations	892,581	3,680	1,124	1,426

Notes: ^a Excluding Morocco ^b Excluding Vietnam, India and Pakistan ^c Excluding Turkey

^d Refers to years in which individuals were under risk for employment (not pursuing full-time education).

Source: Authors' own calculations based on Norwegian registries

Table A1a Continued. Summary statistics for the main independent variables, by country/region. Women.

<i>Country/region of origin</i>	Middle-East ^c	Latin-America	Morocco	Vietnam
<i>Timing</i>				
Year of Birth – Mean (SD)	1991 (3.52)	1989 (4.22)	1987 (4.88)	1988 (4.49)
Historical Time ^d – Mean (SD)	2011.5 (2.74)	2009.9 (3.70)	2008.39 (4.80)	2009.8 (3.94)
Duration – Mean (SD)	1.87 (1.31)	2.24 (1.66)	1.97 (1.48)	1.80 (1.36)
<i>Educational Level</i>				
Lower secondary (%)	56.32	59.45	55.08	35.98
Completed Secondary (%)	28.57	29.78	29.42	34.56
Higher Education (%)	15.11	10.77	15.5	29.47
<i>Field of Education</i>				
General Studies (%)	74.86	76.04	69.98	55.03
Humanistic and Esthetical (%)	3.02	5.27	2.30	4.02
Teaching and Pedagogy (%)	1.37	1.32	2.06	2.13
Social Science and Law (%)	4.40	2.53	2.30	2.72
Economics and Administration (%)	5.08	3.30	3.15	11.12
Science, Crafts and Technical (%)	0.69	1.43	1.45	4.67
Health, Social and Sports (%)	7.69	7.80	17.19	16.75
Agriculture and Fishing (%)	0.00	0.00	0.00	0.00
Transportation and Service (%)	2.88	2.09	1.57	3.55
Others (%)	0	0.22	0	0
<i>Parental Education</i>				
Lower secondary (%)	37.47	28.78	64.71	58.18
Completed Secondary (%)	29.25	42.1	15.49	27.09
Higher Education (%)	26.32	22.46	3.78	6.36
Missing (%)	6.96	6.66	16.02	8.36
<i>Family</i>				
Married (%)	2.75	3.08	7.26	1.95
No children (%)	94.23	86.92	94.55	93.49
One Child(%)	3.98	10.66	3.75	4.73
Two or More Children (%)	1.79	2.42	1.69	1.78
Number of observations	728	910	826	1,690

Notes: ^a Excluding Morocco ^b Excluding Vietnam, India and Pakistan ^c Excluding Turkey.

^d Refers to years in which individuals were under risk for employment (not pursuing full-time education).

Source: Authors' own calculations based on Norwegian registries

Table A1a Continued. Summary statistics for the main independent variables, by country/region. Women.

<i>Country/region of origin</i>	Turkey	India	Pakistan
<i>Timing</i>			
Year of birth – Mean (SD)	1987 (5.26)	1984 (5.48)	1984 (5.59)
Historical time ^d – Mean (SD)	2007.7 (5.31)	2008.15(4.82)	2006.7 (5.50)
Duration – Mean (SD)	2.36 (1.93)	2.26 (2.04)	2.87 (2.71)
<i>Educational Level</i>			
Lower secondary (%)	62.85	22.24	48.84
Completed Secondary (%)	25.28	26.22	30.36
Higher Education (%)	11,87	51,53	20,8
<i>Field of Education</i>			
General Studies (%)	72.27	40.00	63.34
Humanistic and Esthetical (%)	2.18	4.59	2.31
Teaching and Pedagogy (%)	3.09	1.43	1.21
Social Science and Law (%)	0.75	6.63	2.54
Economics and Administration (%)	3.94	15.61	8.86
Science, Crafts and Technical (%)	1.12	4.18	2.23
Health, Social and Sports (%)	15.22	26.12	17.72
Agriculture and Fishing (%)	0.05	0.10	0.05
Transportation and Service (%)	1.28	1.33	1.30
Others (%)	0,11	0.00	0,43
<i>Parental Education</i>			
Lower secondary (%)	76,52	31,68	57.44
Completed Secondary (%)	15,8	28,57	24.39
Higher Education (%)	4,25	32,92	12.14
Missing (%)	3,43	6,83	6.03
<i>Family</i>			
Married (%)	18,25	9,80	18,91
No children (%)	86.75	94.08	84.05
One Child (%)	9.53	4.49	7.62
Two or More Children (%)	3.73	1.43	8.33
Number of observations	1,879	980	6,446

Notes: ^a Excluding Morocco ^b Excluding Vietnam, India and Pakistan ^c Excluding Turkey.

^d Refers to years in which individuals were under risk for employment (not pursuing full-time education).

Source: Authors' own calculations based on Norwegian registries

Table A1b Summary statistics for the main independent variables, by country/region. Men.

Variables				
<i>Country/region of origin</i>	Norway	Europe	Africa ^a	Asia ^b
<i>Timing</i>				
Year of Birth – Mean (SD)	1983 (6.13)	1986 (6.40)	1989 (4.8)	1988 (5.17)
Historical Time ^d – Mean (SD)	2005.6 (5.94)	2007.9 (5.65)	2010.3 (3.99)	2010.1 (4.20)
Duration – Mean (SD)	2.40 (2.45)	2.35(2.18)	2.24 (1.75)	2.02 (1.62)
<i>Educational Level</i>				
Lower secondary (%)	41.79	47.91	65.28	49.82
Completed Secondary (%)	38.44	31.24	26.41	31.89
Higher Education (%)	19.78	20.85	8.30	18.28
<i>Field of Education</i>				
General Studies (%)	53.48	63.41	83.66	70.50
Humanistic and Esthetical (%)	4.02	5.28	0.34	2.16
Teaching and Pedagogy (%)	1.45	1.02	0.27	0.70
Social Science and Law (%)	2.77	3.33	1.09	2.63
Economics and Administration (%)	6.87	8.02	4.42	6.66
Science, Crafts and Technical (%)	23.08	13.11	5.58	10.75
Health, Social and Sports (%)	4.20	3.74	4.36	5.72
Agriculture and Fishing (%)	1.43	0.36	0.07	0.00
Transportation and Service (%)	2,56	1,15	0,20	0,88
Others (%)	0,14	0.59	0.00	0.00
<i>Parental Education</i>				
Lower secondary (%)	27.07	25.84	34.08	32.09
Completed Secondary (%)	50.69	34.81	34.15	33.75
Higher Education (%)	15.02	21.78	23.39	21.81
Missing (%)	7.22	17.56	8.38	12.36
<i>Family</i>				
Married (%)	1.00	1.62	1.08	0.82
No children (%)	94.62	97.49	97.89	98.71
One Child(%)	4.07	1.72	1.57	0.99
Two or More Children(%)	1.31	0.79	0.54	0.29
Number of observations	965,840	3,905	1,469	1,712

Notes: ^a Excluding Morocco ^b Excluding Vietnam, India and Pakistan ^c Excluding Turkey.

^d Refers to years in which individuals were under risk for employment (not pursuing full-time education).

Source: Authors' own calculations based on Norwegian registries

Table A1b Continued, Summary statistics for the main independent variables, by country/region. Men.

Variables				
<i>Country/region of origin</i>	Middle-East ^c	Latin-America	Morroco	Vietnam
<i>Timing</i>				
Year of birth – Mean (SD)	1991 (3.91)	1988 (4.70)	1987 (5.16)	1988 (4.54)
Historical Time ^d – Mean (SD)	2011.1 (3.27)	2009.4 (4.34)	2008.5 (4.67)	2009.8 (3.86)
Duration – Mean (SD)	1.97 (1.41)	2.33 (1.81)	2.73 (2.45)	2.10 (1.67)
<i>Educational Level</i>				
Lower secondary (%)	66.53	70.74	71.57	53.71
Completed Secondary (%)	25.28	21.42	23.63	27.60
Higher Education (%)	8.19	7.84	4.80	18.69
<i>Field of Education</i>				
General Studies (%)	82.19	80.58	85.28	69.01
Humanistic and Esthetical (%)	0.82	3.01	0.46	3.21
Teaching and Pedagogy (%)	0.10	0.64	0.15	0.34
Social Science and Law (%)	1.94	1.46	0.70	2.06
Economics and Administration (%)	4.40	2.28	1.94	7.67
Science, Crafts and Technical (%)	6.45	7.57	6.51	11.70
Health, Social and Sports (%)	3.99	3.56	4.11	4.84
Agriculture and Fishing (%)	0.00	0.09	0.00	0.00
Transportation and Service (%)	0,1	0,73	0,85	1,16
Others (%)	0	0,09	0	0
<i>Parental Education</i>				
Lower secondary (%)	34.82	26.19	55,58	54,74
Completed Secondary (%)	32.02	43.38	19,44	32,11
Higher Education (%)	21.73	24.13	7,11	6,66
Missing (%)	11.43	7.30	17,87	6,48
<i>Family</i>				
Married (%)	1.23	0.51	0.27	1.32
No children (%)	99.08	96.63	97.91	98.16
One Child(%)	0.72	3.10	1.86	1.50
Two or More Children(%)	0.20	0.27	0.23	0.34
Number of observations	977	1,097	1,291	2,333

Notes: ^a Excluding Morocco ^b Excluding Vietnam, India and Pakistan ^c Excluding Turkey.

^d Refers to years in which individuals were under risk for employment (not pursuing full-time education).

Source: Authors' own calculations based on Norwegian registries

Table A1b Continued, Summary statistics for the main independent variables, shown separately by country/region of origin. Men.

Variables			
<i>Country/region of origin</i>	Turkey	India	Pakistan
<i>Timing</i>			
Year of Birth – Mean (SD)	1988 (5.17)	1985 (5.50)	1985 (5.69)
Historical Time ^d – Mean(SD)	2008.1 (5.27)	2007.7 (5.31)	2006.64 (5.62)
Duration – Mean (SD)	2.24 (1.75)	2.40 (2.24)	2.65 (2.47)
<i>Educational Level</i>			
Lower secondary (%)	72.72	37,16	65,74
Completed Secondary (%)	21.62	23,53	21,32
Higher Education (%)	5.66	39,31	12,94
<i>Field of Education</i>			
General Studies (%)	80.68	52.94	78,27
Humanistic and Esthetical (%)	0.77	2.15	0,76
Teaching and Pedagogy (%)	0.24	0.19	0,20
Social Science and Law (%)	0.38	4.20	1,47
Economics and Administration (%)	3.36	14.66	6,11
Science, Crafts and Technical (%)	11.84	11.76	8,15
Health, Social and Sports (%)	1.73	13.35	4,48
Agriculture and Fishing (%)	0.10	0.00	0,01
Transportation and Service (%)	0,86	0,56	0,52
Others (%)	0,05	0,19	0,03
<i>Parental Education</i>			
Lower secondary (%)	72,18	26,31	56,9
Completed Secondary (%)	19,2	31,43	24,73
Higher Education (%)	2,97	32,88	12,38
Missing (%)	5,65	9,38	6.00
<i>Family</i>			
Married (%)	0.39	3.55	2.80
No children (%)	97.36	98.13	94,75
One Child(%)	1.97	1.59	2,96
Two or More Children(%)	0.67	0.28	2,29
<i>Number of observations</i>			
	2,086	1,071	7,120

Notes: ^a Excluding Morocco ^b Excluding Vietnam, India and Pakistan ^c Excluding Turkey.

^d Refers to years in which individuals were under risk for employment (not pursuing full-time education).

Source: Authors' own calculations based on Norwegian registries

Table A2 Full results; regression models 1-3

Variables	Women			Men		
	Model 1	Model 2	Model 2	Model 1	Model 2	Model 2
	b (SE)	b(SE)	b(SE)	b (SE)	b(SE)	b(SE)
Background Country (Reference=Norway)						
Marocco	1.064 (0.0563)	1.159* (0.0679)	1.116 (0.0679)	0.724*** (0.0359)	0.845** (0.0466)	0.853** (0.0470)
Vietnam	0.999 (0.0358)	0.938 (0.0373)	0.916* (0.0372)	0.712*** (0.0232)	0.784*** (0.0275)	0.794*** (0.0277)
Turkey	0.977 (0.0363)	1.014 (0.0411)	0.987 (0.0403)	0.899** (0.0307)	0.978 (0.0363)	0.970 (0.0374)
India	0.739*** (0.0426)	0.684*** (0.0446)	0.650*** (0.0439)	0.691*** (0.0331)	0.800*** (0.0455)	0.806*** (0.0458)
Pakistan	0.765*** (0.0171)	0.759*** (0.0189)	0.738*** (0.0185)	0.805*** (0.0163)	0.951* (0.0230)	0.937** (0.0231)
Europe	0.815*** (0.0260)	0.859*** (0.0276)	0.844*** (0.0275)	0.748*** (0.0221)	0.831*** (0.0280)	0.838*** (0.0279)

Africa	0.705*** (0.0387)	0.737*** (0.0459)	0.726*** (0.0450)	0.559*** (0.0285)	0.663*** (0.0394)	0.663*** (0.0397)
Asia	0.706*** (0.0323)	0.659*** (0.0349)	0.646*** (0.0351)	0.634*** (0.0272)	0.725*** (0.0316)	0.733*** (0.0318)
Latin-America	0.741*** (0.0537)	0.788** (0.0624)	0.776** (0.0624)	0.721*** (0.0443)	0.854* (0.0562)	0.856* (0.0562)
Middle-East	0.731*** (0.0429)	0.849** (0.0508)	0.840** (0.0518)	0.673*** (0.0364)	0.811*** (0.0507)	0.813*** (0.0499)
<i>Duration</i>						
Duration	0.722*** (0.00163)	0.889*** (0.00259)	0.892*** (0.00263)	0.758*** (0.00181)	0.902*** (0.00290)	0.911*** (0.00298)
Duration^2	1.007*** (0.000207)	1.000 (0.000238)	0.999*** (0.000243)	1.002*** (0.000225)	0.993*** (0.000284)	0.993*** (0.000289)

Level of education (Ref=Upper Secondary)

Lower secondary	1.551*** (0.0102)	1.482*** (0.00989)	1.124*** (0.00721)	1.151*** (0.00739)
Higher education	1.801*** (0.0173)	1.554*** (0.0157)	0.860*** (0.00936)	0.912*** (0.00999)

Field of education(Ref.=General Studies)

Humanistic and esthetical	0.977** (0.00824)	0.962*** (0.00822)	2.732*** (0.0416)	2.653*** (0.0412)
Teaching and pedagogy	2.111*** (0.0202)	2.224*** (0.0216)	1.593*** (0.0182)	1.594*** (0.0181)
Social science and law	1.387*** (0.0140)	1.367*** (0.0140)	1.883*** (0.0163)	1.884*** (0.0162)
Economics and administration	1.633*** (0.0136)	1.638*** (0.0138)	3.051*** (0.0198)	3.043*** (0.0197)
Science, crafts and technical	2.255*** (0.0231)	2.246*** (0.0233)	1.766*** (0.0162)	1.743*** (0.0160)
Health, social and sports	2.095***	2.158***	1.900***	1.890***

	(0.0153)	(0.0159)	(0.0292)	(0.0290)
Agriculture and fishing	1.135*** (0.0187)	1.137*** (0.0187)	3.332*** (0.0400)	3.313*** (0.0397)
Transportation and service	2.334*** (0.0303)	2.335*** (0.0303)	0.984 (0.0492)	0.977 (0.0487)
Others	1.130** (0.0462)	1.093* (0.0469)	0.642 (0.151)	0.654 (0.154)
<i>Parental education (Ref=Lower secondary)</i>				
Upper secondary	1.011* (0.00456)	0.998 (0.00454)	0.982*** (0.00448)	0.986** (0.00452)
Short higher education	0.895*** (0.00544)	0.869*** (0.00538)	0.855*** (0.00525)	0.862*** (0.00529)
Long higher education	0.820*** (0.00641)	0.787*** (0.00629)	0.767*** (0.00610)	0.775*** (0.00618)
Missing	1.099 (0.0535)	1.077 (0.0529)	0.935 (0.0428)	0.938 (0.0428)

Family

Married			1.074*** (0.00937)			1.295*** (0.0217)
One child			0.723*** (0.00453)			1.298*** (0.0401)
Two or more children			0.636*** (0.00601)			1.037 (0.0692)
Observations	912270	912270	912270	988901	988901	988901

Notes: Exponentiated coefficients; Standard errors in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
 Africa excluding Morocco. Asia excluding Vietnam, India and Pakistan. Middle East excluding Turkey.
 All models include controls for cohort and year, included as separate dummies for each year
Source: Authors' own calculations based on Norwegian administrative registers

Table A2 Full results; heterogeneity by educational level

Variables	Women			Men		
	Lower secondary	Upper Sec.	Higher Ed.	Lower secondary	Upper Sec.	Higher Ed.
	b (SE)	b(SE)	b(SE)	b (SE)	b(SE)	b(SE)
Background Country (Reference=Norway)						
Morocco	0.845* (0.0635)	0.893 (0.0877)	0.920 (0.172)	0.724*** (0.0359)	0.845** (0.0466)	0.853** (0.0470)
Vietnam	0.768*** (0.0436)	0.798*** (0.0492)	0.851* (0.0539)	0.712*** (0.0232)	0.784*** (0.0275)	0.794*** (0.0277)
Turkey	1.072 (0.0492)	0.825* (0.0631)	1.014 (0.126)	0.899** (0.0307)	0.978 (0.0363)	0.970 (0.0374)
India	0.843 (0.0908)	0.843 (0.111)	0.711*** (0.0502)	0.691*** (0.0331)	0.800*** (0.0455)	0.806*** (0.0458)
Pakistan	0.980 (0.0310)	0.900* (0.0468)	0.887* (0.0436)	0.805*** (0.0163)	0.951* (0.0230)	0.937** (0.0231)
Europe	0.989	0.940	0.698***	0.748***	0.831***	0.838***

	(0.0458)	(0.0526)	(0.0374)	(0.0221)	(0.0280)	(0.0279)
Africa	0.721*** (0.0534)	0.575*** (0.0647)	0.746* (0.103)	0.559*** (0.0285)	0.663*** (0.0394)	0.663*** (0.0397)
Asia	0.762*** (0.0571)	0.685*** (0.0507)	0.733*** (0.0553)	0.634*** (0.0272)	0.725*** (0.0316)	0.733*** (0.0318)
Latin-America	0.842 (0.0786)	1.001 (0.108)	0.752 (0.127)	0.721*** (0.0443)	0.854* (0.0562)	0.856* (0.0562)
Middle-east	0.834* (0.0610)	0.962 (0.0935)	0.652* (0.123)	0.673*** (0.0364)	0.811*** (0.0507)	0.813*** (0.0499)
<i>Duration</i>						
Duration	1.034*** (0.00572)	0.934*** (0.00608)	0.871*** (0.00837)	1.002 (0.00539)	0.950*** (0.00647)	0.881*** (0.0102)
Duration^2	0.991*** (0.000346)	0.989*** (0.000726)	0.987*** (0.00145)	0.988*** (0.000400)	0.982*** (0.000812)	0.985*** (0.00182)
<i>Field of education (Ref.=General Studies)</i>						
Humanistic and esthetical	-	0.970** (0.0103)	-	-	0.898*** (0.0142)	-

Teaching and pedagogy	-	1.118 (0.181)	2.242*** (0.0211)	-	0.964 (0.468)	2.186*** (0.0333)
Social science and law	-	0.929** (0.0236)	1.481*** (0.0154)	-	0.805*** (0.0187)	1.503*** (0.0199)
Economics and administration	-	1.637*** (0.0185)	1.685*** (0.0162)	-	1.539*** (0.0175)	1.709*** (0.0196)
Science, crafts and technical	4.406*** (0.246)	3.150*** (0.0490)	1.852*** (0.0214)	-	3.268*** (0.0235)	1.950*** (0.0214)
Health, social and sports	-	1.038* (0.0185)	1.538*** (0.0488)	-	1.214*** (0.0135)	1.970*** (0.0271)
Agriculture and fishing	-	2.436*** (0.0349)	1.886*** (0.0437)	-	1.852*** (0.0297)	1.890*** (0.0635)
Transportation and service	-	2.334*** (0.0303)	2.335*** (0.0303)	-	3.054*** (0.0452)	2.882*** (0.0509)
Others	1.328 (0.350)	0.848 (0.158)	1.201*** (0.0475)	0.349 (0.246)	0.550*** (0.0740)	0.975 (0.0476)
<i>Parental education (Ref=Lower secondary)</i>						
Upper secondary	1.079***	0.980**	0.968***	1.035***	0.974***	0.968**

	(0.00933)	(0.00737)	(0.00718)	(0.00745)	(0.00694)	(0.0106)
Short higher education	0.949** (0.0164)	0.786*** (0.00882)	0.888*** (0.00744)	0.898*** (0.0111)	0.819*** (0.00780)	0.914*** (0.0106)
Long higher education	0.790*** (0.0238)	0.638*** (0.0111)	0.831*** (0.00802)	0.784*** (0.0158)	0.671*** (0.00931)	0.852*** (0.0106)
<i>Family</i>						
Married	1.109*** (0.0226)	1.026 (0.0200)	1.100*** (0.0110)	1.228*** (0.0606)	1.277*** (0.0556)	1.324*** (0.0221)
One child	0.728*** (0.00886)	0.604*** (0.00741)	0.780*** (0.00679)	1.499*** (0.0263)	1.317*** (0.0258)	1.439*** (0.0223)
Two or more children	0.729*** (0.0120)	0.493*** (0.00951)	0.696*** (0.00885)	1.381*** (0.0520)	1.117* (0.0545)	1.466*** (0.0399)
Observations	329931	286894	293945	416171	416171	416171

Notes: Exponentiated coefficients; Standard errors in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.00$.

Africa excluding Morocco. Asia excluding Vietnam, India and Pakistan. Middle East excluding Turkey.

All models include controls for cohort and year, included as separate dummies for each year

Source: Authors' own calculations based on Norwegian administrative registers

Figure A1 Relative rate of transition from education to work for male and female minorities compared to the majority. Discrete time hazard regression models. Alternative specification with 1G as earnings threshold instead of 2G

Notes: The vertical line indicates a relative rate of 1, i.e. the same rate as the majority population. Error bars at 95 per cent confidence level. Model 1 includes individual year of birth, historical time, duration and duration-squared. Model 2 also includes grade average at the end of lower secondary education. Model 3 also includes level and field of education, parental education, marital status and number of children. Africa excluding Morocco. Asia excluding Vietnam, India and Pakistan. Middle East excluding Turkey.

Source: Authors' own calculations based on Norwegian administrative registers

Figure A2 Relative rate of transition from education to work for male and female minorities compared to the majority. Discrete time hazard regression models. Alternative specification with 1G as earnings threshold instead of 2G

Notes: The vertical line indicates a relative rate of 1, i.e. the same rate as the majority population. Error bars at 95 per cent confidence level. Africa excluding Morocco. Asia excluding Vietnam, India and Pakistan. Middle East excluding Turkey.

Source: Authors' own calculations based on Norwegian administrative registers

Figure A3 Relative rate of transition to from education to work for male and female minorities compared to the majority. Discrete time hazard regression models. Alternative specification with number of years since completion of lower secondary school.

Notes : The vertical line indicates a relative rate of 1, i.e. the same rate as the majority population. Error bars at 95 per cent confidence level. Model 1 includes individual year of birth, historical time, duration and duration-squared. Model 2 includes the following intermediate variables: level and field of education and parental education. Model 3 also includes marital status and number of children. Africa excluding Morocco. Asia excluding Vietnam, India and Pakistan. Middle East excluding Turkey

Source: Authors' own calculations based on Norwegian registries

Figure A4 Relative rate of transition from education to work for male and female minorities compared to the majority, by educational level. Discrete time hazard regression models. Alternative specification with 1G as earnings threshold instead of 2G

Notes: The vertical line indicates a relative rate of 1, i.e. the same rate as the majority population. Error bars at 95 per cent confidence level. Africa excluding Morocco. Asia excluding Vietnam, India and Pakistan. Middle East excluding Turkey.

Source: Authors' own calculations based on Norwegian administrative registers

Figure A5 Relative rate of transition from education to work for male and female minorities compared to the majority. Discrete time hazard regression models. With controls for grade average at the end of lower secondary education in model 2.

Notes: The vertical line indicates a relative rate of 1, i.e. the same rate as the majority population. Error bars at 95 per cent confidence level. Model 1 includes individual year of birth, historical time, duration and duration-squared. Model 2 also includes grade average at the end of lower secondary education. This variable is based on the average grade level (“Grunnskolepoeng”) at the completion of lower secondary school, at age 16. This information is available for the majority of individuals born in the 1984-1997 cohorts. The relevant grades are awarded on a 1-6 scale, and both overall achievement grades and exam grades are included. The average of all grades is calculated and multiplied by ten to obtain the value of the variable on a metric scale.

Africa excluding Morocco. Asia excluding Vietnam, India and Pakistan. Middle East excluding Turkey

Source: Authors’ own calculations based on Norwegian administrative registers

Notes

¹ This pattern is documented for the following groups: Immigrants from Morocco and outside the EU in Belgium, and for Moroccan immigrants in Spain (Kalter and Kogan 2006); immigrants (with master degree) from Western Europe, Eastern Europe, North America, Asia and Africa in Norway (Brekke 2007); non-western immigrants and their children in Flanders (Vanoverberghe et al. 2008); second-generation immigrants in Denmark (Nielsen et al. 2003); descendants of immigrants originating in Africa, The Middle East and Latin-America in Sweden (Tasiran and Tezic 2007); and male second-generation immigrants from Maghreb, previous French colonies in Africa, Sub-Saharan Africa, South-East Asia and Turkey in France (Toma 2015). Gupta and Kromann (2014) document lower rates of job-offers for unemployed children of western and non-western immigrants in Denmark. Exceptions to the pattern of disadvantages are found for EU immigrants to Spain (Kalter and Kogan 2006), minority women with the lowest level of education in Denmark (Gupta and Kroman 2014) and male children of South-European immigrants in France (Toma 2015).

² This threshold implies eligibility for unemployment benefits as well as pension related to disability and old age.

³ We first included individual education (level and field) separately, and then included parental education, but these models did not differ significantly (available on request). We therefore combine these two models into Model 2.

⁴ There are two exceptions: Male descendants of immigrants from Turkey perform on par with the majority population when these intermediate variables were included, indicated their educational disadvantage (see Table A1b). On the other hand, female descendants of

Vietnamese immigrants are more disadvantaged *after* adjustments were made, which is related to their relative lower level of family obligations (see Table A1a)

⁵ While including grades for upper secondary and subsequent education or a measure of general ability would be interesting, such information unfortunately is not available, nor would grades at this level arguably constitute a true pre-market measure.