Income Advantages of Poorly-Qualified Immigrant Minorities

Why School Dropouts of Turkish Origin Earn More in Germany*

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Abstract

We investigate an often overlooked implication of the signaling model of statistical discrimination: if immigrant minorities’ educational qualifications carry less signaling power, poorly-qualified minority members should experience *positive* statistical discrimination. We argue that the lower signaling power stems from disadvantages associated with insufficient language skills and lack of supportive parental resources, which prevent minority students from achieving those educational qualifications that would reflect their high motivation and ambition. Yet, if education counts less, so does its lack. Using data from the German Microcensus, we compare log hourly personal income of 1.5th and 2nd generation Spätaussiedler and persons of Turkish origin to that of native Germans. Using (semi-parametric) generalized additive models, we find solid support for our claim that poorly-qualified persons of Turkish origin experience income advantages; they frequently work in jobs for which they are underqualified. Once different frequencies of over- and undereducation are taken into account, no ethnic differences in educational returns remain. Our results extend to other comparable immigrant groups in Germany.

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1 Introduction

Social scientists repeatedly provide evidence about immigration-related ethnic inequalities in European labor markets. Immigrants and their children, the so-called second generation, have more difficulties in finding a job, stay unemployed for longer, find less prestigious jobs, and earn less than natives (for a comparative review see Heath et al., 2007). These disadvantages are largely due to their on average lower levels of education (Kalter and Granato, 2002), insufficient language skills (Dustmann and Soest, 2002), and inferior social embeddedness (Lancee, 2012). Yet, significant differences remain after these facts are accounted for. Correspondence tests convincingly show the remaining disadvantages to be, at least partly, the result of employer discrimination (Kaas and Manger, 2012).

In their attempt to explain discrimination, social scientists commonly distinguish between taste-based and statistical discrimination. Taste-based discrimination assumes a general dislike among employers against certain groups, which turns them to trade a loss of profits against not having to employ members of the disliked group (Becker, 1971). Statistical discrimination by contrast, starts from the premises of unprejudiced and profit-maximizing employers who have insufficient knowledge about applicants' individual productivity. To overcome their uncertainty, they rely on group-level estimates associated with the applicants' ascriptive characteristics (Phelps, 1972; Arrow, 1973).

We investigate an often overlooked implication of the signaling model of statistical discrimination: if immigrant minorities' educational qualifications carry less signaling power, poorly-qualified minority¹ members should experience *positive* discrimination. The reason is that since their poor qualifications are untrustworthy signals, they probably understate their unobserved true skills. We modify this model based on an argument why specifically poorly-qualified minority applicants' qualifications should be less trustworthy. That is, disadvantages in the educational

¹In this article we use the terms, minority, immigrant minority and persons of immigrant origin interchangeably.

system, which derive from insufficient language skills and their parents' lack of supportive resources, prevent minority students from achieving educational qualifications that would reflect their high motivation and ambition. It is therefore plausible that employers have in the past observed so-called non-cognitive qualities (such as motivation, dependability and persistence) among poorly-qualified minority employees that poorly-qualified majority employees tend to lack. Other well-established mechanisms, most importantly the social capital of ethnic communities (Portes and Rumbaut, 2006, p. 85-93), are probably more important in explaining success among persons of immigrant origin. Nevertheless, we maintain that the advantages we study (see below) cannot be accounted for by such well-established approaches.

Using data from the German Microcensus, we compare the personal income returns to education of Spätaussiedler² and persons of Turkish origin who immigrated before the age of thirteen (1.5th generation) or were born in Germany (2nd generation) to those of native Germans. In line with our argument, evidence from both (semi-parametric) generalized additive and classic OLS models suggests that school dropouts of Turkish origin experience income advantages relative to native German dropouts. In line with the recent literature on job-skill mismatches among immigrants, we can show that they frequently work in jobs for which they are formally underqualified and that once different frequencies of over- and under-qualification are taken into account no advantages remain. Spätaussiedler, who are characterized by better language skills and access to more supportive parental resources, fare similar to native Germans at all levels of the educational ladder. These results extend to comparable immigrant groups in Germany.

²Persons of German descent who were born in countries of the former Warsaw pact or ex-Yugoslavia.

2 Theoretical background

In this section we derive an argument based on implications of the signaling model of statistical discrimination according to which poorly-qualified minority members may experience positive discrimination. Our focus on positive statistical discrimination does not imply it was the only factor influencing the value of education to immigrant minorities. Other factors, such as minorities' location in areas of particular productivity due to chain migration and the social capital generated in the ethnic communities of these areas (Portes and Rumbaut, 2006, p. 85-93), are well-understood forces of success among immigrant minorities and might also have a bearing on the value of education to minorities. We discuss these approaches in online Appendix B, along with extensive evidence that the advantages we study cannot be accounted for by them. Here we focus on statistical discrimination, by first introducing the general idea and the special case of the signaling model of statistical discrimination. We then derive the positive discrimination implication arising from assuming minorities' educational qualifications carry less signaling power, and propose a modified version of this argument that assumes less signaling power of education with regards to non-cognitive skills among poorly-qualified minorities only. After that we connect this discussion to the recent literature on job-skill mismatches among immigrants to propose another modification from the classical model. Finally, we introduce Spätaussiedler and persons of Turkish origin as theoretical test cases to examine the derived implications.

According to the classical theory of statistical discrimination differential treatment based on ethnic background results from a lack of information (Phelps, 1972; Arrow, 1973). This approach portrays employers as unprejudiced profit-maximizing actors who seek to hire the most able workers at prevailing wages. Yet, since employers have insufficient knowledge about applicants' true skills, job and wage offers are decisions made under uncertainty. Employers try to compensate for the lack of information, by relying on unbiased group-level estimates about average productivity associated with the applicants' ascriptive characteris-

tics (gender, ethnicity and so on). The classical approach assumes unbiased estimates, since “Employers who are inefficient in this function will tend to be weeded out by the “market mechanism” of competition” (Aigner and Cain, 1977, 177), and more importantly because the initial attempt was to show that discrimination is conceivable without assuming prejudiced or biased employers.

A special case of statistical discrimination theory is the signaling model (Phelps, 1972; Aigner and Cain, 1977), which assumes that employers rely on group-level estimates to the degree that signals of unobserved true skills, such as educational qualifications, are imperfect. The idea can be formalized as:

$$\hat{q} = (1 - \gamma)\alpha + \gamma y$$

where $\hat{q}$ is the estimate of the true ability q and α is the mean of the distribution of q , or the group stereotype. y is an indicator of the true ability q and γ is the reliability of y , which varies between $0 < \gamma < 1$.

Expressed in words, this model assumes that employers rely on two kinds of information to estimate an individual applicant’s skills: group-level estimates associated with the person’s ascriptive group membership (α), and personal indicators of their skills (y). These two kinds of information stand in a negative relation to one another, so that the more reliable the indicator of unobserved skills, the smaller the employer’s uncertainty and need to consider group-level estimates. Accordingly the importance of group-level estimates can be reduced, if applicants provide reliable signals of their skills.

2.1 What if immigrant minorities’ educational qualifications carry less signaling power?

A classical scenario considers that while employers infer unobserved skills from observable educational qualifications, they are particularly bad at doing this for minority compared to majority workers (Aigner and Cain, 1977; Midtbøen, 2014).

In short, educational qualifications are presumably less reliable signals for minorities ($\gamma_{\text{Minority}} < \gamma_{\text{Majority}}$). Figure 1 visualizes the implications in the style of Aigner

Figure 1: Signaling model of statistical discrimination

and Cain (1977). The gray angle-bisecting line represents the ideal-typical case, where educational qualifications are a perfect indicator of true skills and group-level estimates are irrelevant. The flat gray line represents the opposite, where education is a meaningless indicator of true skills, so that employers rely on group-level estimates exclusively. Since $\gamma_{\text{Minority}} < \gamma_{\text{Majority}}$, minorities' blue-dashed line in Figure 1 approximates the flat line more closely than majorities' black-solid line. Interestingly, this implies that profit maximizing employers would negatively discriminate highly-educated minorities as much as they would positively discriminate poorly-educated minorities. This result does not only follow from the formal model, but is also intuitive: if educational qualifications are a poor indicator, a person with few qualifications is probably better than those qualifications imply. Taken from another angle, the expectations concerning the ability of majority applicants with poor qualifications are lower than those concerning poorly-qualified minority applicants, because the majority applicants' qualifications, which identify them as little-skilled, are more trustworthy (Kalter, 2003, 105). This reasoning is

in line with studies that show wage returns to formal qualifications to be larger for majorities, whereas the returns to cognitive skills are larger for (immigrant) minorities (Kerckhoff et al., 2001; Nordin and Rooth, 2009).

2.2 A modified argument on excess non-cognitive skills among poorly-educated immigrant minorities

The classical model generally considers qualifications as signals of cognitive skills and assumes the lower signaling reliability of qualifications among minorities to be constant across the educational ladder. We question both assumptions and propose a modified argument. First, we follow the seminal argument of Bowles and Gintis (1976) according to which qualifications also signal non-cognitive skills such as motivation, tenacity and dependability. Second, we claim that especially poorly-qualified minority members are characterized by a noticeable tendency for higher non-cognitive skills than their qualifications imply. After all, the children of immigrants are known for their high aspirations and status attainment motivation despite their on average lower academic performance (Kristen and Dollmann, 2010; Salikutluk, 2013). These aspirations for upward mobility do not come as a surprise, since immigrants tend to be positively selected “for their drive, ambition and high aspirations” (Heath and Brinbaum, 2007, 297). Against this background, it is plausible that employers have in the past observed non-cognitive qualities among poorly-qualified minority employees, such as motivation, dependability and persistence, that poorly-qualified majority employees frequently lack. The same argument is not applicable to highly-educated minorities, since they have successfully materialized their aspirations. In other words, while the classical model assumes group-specific signaling reliability of cognitive skills, we argue for group- and education-level specific signaling reliability of non-cognitive skills.

Our argument hinges upon the assumption that a substantial share of poorly-qualified minority applicants were not able to materialize their persistence and motivation in school. We propose insufficient language skills and their parents’

poor educational resources as plausible reasons. Poor language skills restrain children from participating in the classroom and thus from fully exploiting their talents and ambition (Esser, 2006). In fact, language skills are the core determinant of why immigrant children are less often considered to meet the cognitive requirements for admission to primary school by public officials in Germany (Becker and Biedinger, 2006). Similar reasoning applies to children of immigrants’ social and cultural background: “Immigrant families lack familiarity with the host society and its institutions, and when parents have limited education the combination is potent” (Alba et al., 2011, 401). In line with this argument, existing studies suggest that immigrant parents’ language skills (Esser, 2006), knowledge about the educational system and involvement with homework (Van De Werfhorst and Van Tubergen, 2007; Kristen, 2005) are important predictors of their children’s academic performance and achievement.

In summary, we argue for a modified signaling model of statistical discrimination, because existing research demonstrates that children of immigrants tend to be particularly motivated and ambitious but also particularly disadvantaged in materializing their aspirations. If this argument holds, the general logic of statistical discrimination predicts higher wages that reward persons of immigrant origin’s surplus non-cognitive skills.

2.3 The job-skill mismatches perspective

The recent literature on job-skill mismatches among immigrants allows for a third modification of the argument. Rather than earning higher wages as compensation, their excess non-cognitive skills might result in access to jobs for which poorly-educated immigrants would usually seem formally unqualified. According to Chiswick and Miller’s (2008; 2010) seminal studies on the US, Canada and Australia, well-educated first-generation immigrants tend to be overeducated for the jobs they work because their foreign qualifications are less reliable signals to employers. Since surplus skills generate lower returns, immigrants’ returns to school-

ing are smaller. This is only half the story, however, because the great majority of poorly-educated immigrants face the opposite situation, that is, they are formally underqualified for the jobs they work. While underqualified employees earn less than their correctly-matched colleagues in the same occupation, the penalty does not cancel out the advantage of working in a job that is above their qualification level. In other words, they make less than their correctly-matched colleagues in the same occupation, but more than their correctly-matched peers with similar education. Chiswick and Miller (2008) reason that poorly-educated immigrants are likely to be more talented and motivated than similarly educated natives because they represent positively selected groups from their home countries. Several studies relying on the ORU-decomposition methodology (see section 3.2 for details) have re-confirmed these claims (e.g. Hardoy and Schöne 2014; for particular evidence on Germany (plus Austria and France) see Anastassova 2010). It stands to reason that the disposition for excess non-cognitive skills of domestically-educated persons of immigrant origin similarly translate into increased access to occupations for which they would seem formally unfit. After all, non-cognitive skills are more important than cognitive skills for job entry among low achievers in Germany (Protsch and Solga, 2015).

2.4 Persons of Turkish origin and Spätaussiedler in Germany

From 1955 to 1973 Germany recruited a low-qualified immigrant labor force. The so-called guest workers came mainly from Turkey and other South European countries such as Italy and Greece to improve their economic situation as unskilled factory workers (Kalter and Granato, 2007). In response to the economic recession after the OPEC oil embargo all guest-worker recruitment was stopped, and Germany introduced incentives for guest workers to return to their home countries. While many indeed returned, immigration nevertheless continued due to family reunification. Another group of immigrants was treated differently and even en-

ticed to settle in Germany with direct access to citizenship, minor hurdles to have their foreign qualifications officially recognized, and special integration programs. The immigration of Spätaussiedler, i.e. co-ethnic Germans from countries of the former Warsaw pact or ex-Yugoslavia who partly joined families but also fled the discrimination and political instabilities of the (post-)Soviet regimes, surged from the late 1980s to the late 1990s (Dietz, 2006).

This study compares domestically-educated children of immigrants (2nd generation) and immigrant children who came to Germany before the age of thirteen (1.5th generation) to native Germans; only for these does our proposed mechanism of non-materialized ambition and motivation apply. Among these, we focus on persons of Turkish origin and Spätaussiedler. Both are not only the two largest immigrant groups in Germany (Bundesamt für Migration und Flüchtlinge, 2013), but also lend themselves as theoretical test cases. First, as co-ethnic German immigrants Spätaussiedler are generally characterized by better German language skills than persons who originate from former guest worker sending countries such as Turkey (Haug, 2005). This is also reflected in the fact that they are apt to speak German more frequently at home than persons of Turkish origin (Strobel and Kristen, 2015). Second, Spätaussiedler fare considerably better in the labor market than other immigrants (Luthra, 2013; Kogan, 2011), whereas the opposite holds for persons of Turkish origin (Kalter and Granato, 2007). Third, Spätaussiedler are known for their comparatively high levels of education (Konietzka and Kreyenfeld, 2001), which again contrasts with persons of Turkish origin (Kalter and Granato, 2007). Finally, it is particularly students of Turkish origin (in stark contrast to Spätaussiedler) who hold higher aspiration and status attainment motivation than German natives (Salikutluk, 2013), which seems due to their parents' high levels of aspirations (Relikowski et al., 2012). Taking all four factors³ together, we see that Spätaussiedler have exactly the resources discussed above to support their

³As mentioned above, the two groups also differ somewhat in their initial motivations to immigrate to Germany. But we do not see how these should additionally relate to non-materialized aspirations

children’s educational careers, whereas immigrants of Turkish origin tend to lack them. We expect a similar relation between the support 2nd generation and 1.5th generation immigrants receive. The comparison of the four resulting groups may shed light on the plausibility of our arguments.

3 Data and Methods

Our analyses rely on scientific use files (SUF) of the German Microcensus. The Microcensus is an annual one-percent survey of all German households and SUF are 70 percent samples of the Microcensus. SUF cover detailed information on education and labor market performance of all household members and contain large, representative samples of persons of immigrant origin. Since 2005, the Microcensus also identifies Spätaussiedler. The survey is based on oral interviews or self-completed questionnaires, and the majority of questions are compulsory. Because households stay in the sample for four years but repeated observations cannot be identified, we separately analyze three sets of cross-sections that pool two independent samples (2011 & 2007, 2010 & 2006, and 2009 & 2005). We summarize the results using Rubin’s (1987) formulas for repeated imputation summary statistics. Despite the somewhat low number of minority cases per single Microcensus cross-section, this strategy ensures the reliability of our results.

3.1 Sample

The empirical analyses are conducted for adults of working age (between 18 and 64 years) who are not enrolled in education, military or civil service, live in private homes, work at least fifteen hours a week, report earnings as their main source of income, and (for the sake of applying the ORU-decomposition) work only one job. Among this population, we focus on native Germans, Spätaussiedler and children of Spätaussiedler, as well as persons of Turkish (immigrant) origin. An immigrant origin is defined as being born abroad or having at least one parent

who was born abroad. Above that, we require all foreign-born respondents to have immigrated to Germany by the age of twelve and to have acquired both their highest general-schooling qualification and their highest occupational qualification in Germany.

3.2 Variables

We analyze log hourly personal income in this article, because there is no direct question on earnings in the Microcensus. To exclude the possibility that non-wage income sources bias our estimates we only consider people whose main source of income is work (see sample definition) and control for variables that capture central non-wage income differences, such as marital status or the number of children (see control variables). The SUF report 24 personal monthly income brackets. Following Pischke (2007), we assign each individual income equal to the bracket midpoint, and the top bracket of 18,000+ we assign to €24,000. We then convert the variable to an hourly personal income by dividing by the number of work hours. The validity of our dependent variable can be evaluated, by its association with well-established wage-predictors, most of which we control for. As can be seen from Supplementary Table A.2, these associations indeed cross-validate our measure; examples include (marginal) returns to job experience, company size, or working in a licensed occupation (Haupt, 2013).

The main predictor variable is education in two operationalizations. The Microcensus provides the highest general-schooling qualification, which covers secondary schooling certificates, and the highest occupational qualification, which refers to vocational or tertiary education. We code these qualifications into years of education and combine general-schooling and occupational qualifications, so that overall years of education run from 7 (dropouts), over 9 (the lowest qualification, i.e. “Hauptschulabschluss”), to 21 (PhD) years. For the particular coding see Supplementary Table A.1. The resulting overall years of education can be decomposed into the years of required, over-, and undereducation, which allows

us to test our hypotheses in one coherent measurement framework. Because one might be concerned with the operationalization of education in terms of years, we use (semi-parametric) generalized additive models (see modeling strategy below). Moreover, we check the sensitivity of our findings with categorical education measures based on the well-established Casmin classification (see Supplementary Figure A.2).

To test the implications of our job-skill mismatches argument, we decompose overall education into the years of typically-required, over-, and undereducation. The crucial factor in measuring over- and undereducation is the operationalization of the typically-required years of education in a given occupation; it is the reference. We use the so-called realized matches procedure, which relies on the actual years of education of workers in each occupational category (for a review see McGuinness, 2006). We distinguish occupations via the ISCO88 classification. There are divergent views on the best measure of typically-required education, with some favoring occupation-specific means and others modes. In line with Chiswick and Miller (2010, 2008), we here report results based on occupation-specific mean years of education, because they cover a more detailed range of values than mode years, which strongly benefits the estimation of generalized additive models. In the next step, employees' actual years of education are compared to their occupation's typically-required education to determine whether they meet the apparent job standards. The years of surplus or deficit education are captured in separate variables (i.e. over- and undereducation), because the income penalty of lacking a year of education is larger than the advantage of a surplus year. Overeducated respondents receive zero years of undereducation and vice versa. Another reason for using occupation-specific means to measure typically-required education, is the possibility to standardize over- and undereducation by occupation-specific standard deviations of the years of education. This is important given that occupations differ in the variation of educational degrees they encompass. In other words, the same typically-required education might be more "required" in some occupations

than in others. Occupation-specific standardization acknowledges this fact. The operationalization relies on all employees and not the restricted sample discussed above.

We adjust results for the following control variables: gender, age and age², job experience in years (also squared), a detailed family status variable (see Supplementary Table A.2), the number of children younger than 18, the presence of pre-school children in the household, settlement structure (see Supplementary Table A.2), part-time work, tenure, public sector and self-employment, the share of Spätaussiedler and persons of Turkish origin in the occupation⁴ (aggregated by federal state and by settlement structure), working in a highly regulated and licensed occupation (Haupt, 2013), paid overtime, frequency of shift work, frequency of work on Sundays and public holidays, company size in terms of the number of employees, whether the respondent visited further training workshops last year, and finally year and workplace’s federal state fixed effects. Table 1 shows descriptive statistics for the dependent and predictor variables for each of the three pooled samples. Spätaussiedler and persons of Turkish origin make less income. The 2nd generation fares worse than their 1.5th generation co-ethnics, which is likely to be a question of age. There are clear educational differences, with natives being the most formally educated, followed by 1.5th and 2nd generation Spätaussiedler, the descendants of immigrants from Turkey, and finally immigrants from Turkey. Educational differences are particularly pronounced for percent school dropouts. Vice versa to our argument about excess non-cognitive skills of poorly-educated immigrant minorities, their marginal size of ca. 0.6% implies that native German school dropouts are probably a particularly disadvantaged group. Because over- and undereducation are themselves related to the actual level of education, i.e. the chance of being overeducated increases with the level of education, a similar pattern also shows for the average years of required, over-, and undereducation. Table 1 also

⁴Our results are robust to the additional inclusion of interaction terms between the groups and generations with the occupation-shares of Spätaussiedler and people of Turkish origin (see Supplementary Figure A.1).

Table 1: Descriptive statistics of dependent and predictor variables

	Native Germans		1.5 th generation Spätaussiedler		2 nd generation Spätaussiedler		1.5 th generation Turkish origin		2 nd generation Turkish origin	
	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.
<i>Sample 2011 & 2007</i>										
Personal hourly income	12.10	7.75	11.00	6.12	7.89	3.23	11.53	5.19	9.58	4.27
ln(personal hourly income)	2.37	0.50	2.29	0.47	1.96	0.52	2.35	0.45	2.16	0.47
Overall years of education	13.83	2.54	13.42	2.57	12.85	2.26	11.55	2.81	12.09	2.56
% School dropouts	0.59	7.67	1.11	10.48	1.47	12.04	9.20	28.92	4.12	19.87
Typically-required education	13.60	1.81	13.32	1.70	12.92	1.48	12.56	1.44	12.69	1.38
Overeducation	0.39	0.57	0.36	0.55	0.31	0.44	0.20	0.45	0.24	0.48
% Overeducated*	13.33	33.99	11.94	32.44	8.50	27.94	5.65	23.10	7.43	26.23
Undereducation	0.28	0.50	0.30	0.53	0.34	0.61	0.69	0.85	0.53	0.71
% Undereducated*	8.96	28.56	10.93	31.20	14.66	35.43	31.16	46.33	24.80	43.20
Observations	252,833		3,240		341		1,521		1,871	
<i>Sample 2010 & 2006</i>										
Personal hourly income	12.05	8.31	11.18	6.63	7.70	4.10	11.35	6.37	9.73	4.64
ln(personal hourly income)	2.35	0.53	2.28	0.53	1.91	0.56	2.32	0.50	2.16	0.52
Overall years of education	13.81	2.52	13.58	2.64	13.06	2.53	11.48	2.60	12.15	2.62
% School dropouts	0.63	7.94	1.25	11.13	2.83	16.61	8.17	27.40	3.93	19.43
Typically-required education	13.62	1.83	13.47	1.78	13.18	1.61	12.54	1.35	12.73	1.43
Overeducation	0.37	0.56	0.36	0.55	0.34	0.55	0.17	0.41	0.25	0.47
% Overeducated*	13.28	33.94	12.90	33.52	12.26	32.85	4.76	21.29	7.79	26.81
Undereducation	0.28	0.51	0.31	0.55	0.40	0.68	0.69	0.82	0.53	0.73
% Undereducated*	9.12	28.79	11.68	32.12	17.61	38.15	31.34	46.40	24.82	43.21
Observations	267,966		2,869		318		1,640		1,656	
<i>Sample 2009 & 2005</i>										
Personal hourly income	11.88	8.27	11.29	8.28	9.64	7.00	10.90	5.08	9.72	5.27
ln(personal hourly income)	2.33	0.53	2.28	0.54	2.11	0.59	2.29	0.49	2.16	0.52
Overall years of education	13.80	2.52	13.54	2.67	13.37	2.64	11.29	2.66	12.13	2.58
% School dropouts	0.64	7.95	1.56	12.38	1.53	12.28	9.50	29.33	4.32	20.33
Typically-required education	13.62	1.83	13.44	1.80	13.26	1.72	12.48	1.31	12.76	1.39
Overeducation	0.37	0.56	0.36	0.56	0.37	0.55	0.18	0.44	0.25	0.49
% Overeducated*	13.21	33.86	12.94	33.57	12.73	33.36	4.97	21.75	7.65	26.59
Undereducation	0.28	0.51	0.31	0.54	0.32	0.58	0.76	0.87	0.54	0.75
% Undereducated*	9.11	28.77	11.16	31.49	12.90	33.55	35.52	47.87	24.68	43.13
Observations	257,828		3,021		589		1,568		1,621	

Sample: Men and women in working age (between 18 and 65 years) who are not enrolled in education, live in private homes, work at least fifteen hours a week, are not enrolled in military or civil service, whose work is their main source of income, and (for the sake of applying the ORU-decomposition) work only one job.

* Relies on persons with at least one year of occupation-standardized over- or undereducation

displays the percent of over- and undereducated employees, here operationalized as having more than one year of occupation-standardized over- or undereducation. The better educated natives and Spätaussiedler are overeducated much more frequently than persons of Turkish origin. But the more striking disparity concerns undereducation. Particularly 1.5th and 2nd generation persons of Turkish origin are 3.9 and 2.7 times as likely to be undereducated as German natives. Both the prevalence of undereducation and the marginal frequency of overeducation suggest that domestically-educated persons of immigrant origin face a different situation than well-studied foreign-educated (first-generation) immigrants (e.g. Chiswick and Miller 2008; for Germany (plus Austria and France) see Anastassova 2010). We cannot investigate why this is the case within the framework of this study, but wish to remark that these patterns already speak in favor of our argument that particularly poorly-educated persons of Turkish origin have access to jobs for which they seem formally unqualified.

3.3 Modeling strategy

In our analysis we estimate ethnic group specific log hourly personal income by years of education and decomposed years of typically-required, over-, and undereducation. We use generalized additive models (Hastie and Tibshirani, 1990) that relax the linearity assumption for years of education as predictor. That is, our models condition for the above-discussed control variables in a common parametric way (similar to OLS), but estimate group-specific smoothing splines for years of education as predictor of log hourly personal income.

Smoothing splines are a generalization of parametric regression splines (for a brief review see: Andersen, 2009). Parametric regression splines are piecewise (polynomial) regressions where so-called knots define the pieces. The analyst needs to define the number and location of knots. One could for example believe the first ten years of education linearly predict income, but after this knot the relation becomes exponential. Smoothing splines are cubic and allow for knots

at all unique values x_i . To prohibit overfitting, they contain a penalty term that shrinks the relation towards linearity and results in small “effective degrees of freedom”. The splines of generalized additive models are sometimes referred to as semi-parametric, because they prohibit interactions unless explicitly specified; they maintain additivity. The two models can be written as:

$$y = \alpha + f_{1g}(x_{\text{educ.}}) + \sum_{j=1}^k \beta_j x_j + \epsilon \quad (1)$$

$$y = \alpha + f_{2g}(x_{\text{typ.-req.}}) + f_{3g}(x_{\text{over.}}) + f_{4g}(x_{\text{under.}}) + \sum_{j=1}^k \beta_j x_j + \epsilon \quad (2)$$

where f_1 to f_4 are arbitrary and group-specific functions (hence the subscript g) estimated from the data, x_j are control variables and ϵ is an error term. Because we estimate non-parametric relations, we visualize our results along with 95%-confidence intervals.

We apply this estimation procedure to each of the three pooled cross-sections. To summarize the triple-replicated results, we use Rubin’s (1987) formulas for repeated imputation summary statistics. Because they formally acknowledge the uncertainty between the three replications, the summarized triple-replicated results are more reliable than those based on the single cross-sections. For this reason all reported evidence, including the sensitivity analyses and robustness tests, are based on triple-replicated and summarized results. Of course our conclusions about income advantages also hold for each of the three pooled cross-sections separately.

4 Results

Figure 2 displays the results of our generalized additive models of log hourly personal income; Supplementary Table A.2 shows results for the control variables. The four panels visualize how the (non-parametric) income returns to overall years

of education of 1.5th and 2nd generation Spätaussiedler and persons of Turkish origin differ from those of native Germans. The two top panels show that both generations of Spätaussiedler fare generally similar to natives across the whole educational ladder. Whether low- or highly-qualified, the confidence intervals of the dashed line (for natives) and of the solid line (for minorities) always overlap. For the second generation, the results are very imprecise among the poorly and highly qualified, which raises concerns whether the group makes for a suitable comparison. Yet, we would like to offer a different perspective. There are few second-generation Spätaussiedler dropouts, because in contrast to children of Turkish origin they have the support it needs. In other words, the small number of poorly-qualified is not a methodological problem, but actually a result that speaks in favor of our claims. Below we present further evidence in favor of this interpretation with regard to persons originating from affluent neighboring countries. The lower two panels show a different picture for persons of Turkish origin. School dropouts of Turkish origin earn significantly more than natives. This holds for both generations, though the advantage is more pronounced for those who were born in Turkey and immigrated before the age of 13 (the 1.5th generation). According to predictions from our models, they make roughly 63.9% more than natives, while those who were born in Germany make 42.6% more. This considerable income advantage, which is partly the result of the small-hourly-income denominator of unskilled native workers, vanishes with the achievement of the lowest educational qualification, i.e. the “Hauptschulabschluss” after nine years of schooling. For the rest of the educational ladder, up until the PhD with 21 years of schooling, the groups fare similarly. One might be concerned with the operationalization of education in terms of years. Supplementary Figure A.2 visualizes the results of a common OLS regression with education operationalized as Casmin-categories. The results are largely similar, and across both estimation strategies we find income advantages of dropouts of Turkish origin, with those who were born in Turkey experiencing a larger advantage compared to those who

Figure 2: Income returns to overall years of education

Note: Estimates are from generalized additive models that control for: Age and age², gender, job experience (also squared), family status, number of children below 18, presence of pre-school children, settlement structure, year and federal state fixed effects, part-time work, tenure and self-employment, working in a licensed occupation, public sector employment, opportunity to work paid overtime, frequency of shift work, frequency of working on Sundays or public holidays, company size, occupation-share of Spätaussiedler and persons of Turkish origin, and finally visits of further-training workshops last year; $n_{2011\&2007} = 259,806$, $n_{2010\&2006} = 274,449$, $n_{2009\&2005} = 264,627$

Figure 3: Income returns to typically-required education

Note: Estimates are from generalized additive models that control for: Age and age², gender, job experience (also squared), family status, number of children below 18, presence of pre-school children, settlement structure, year and federal state fixed effects, part-time work, tenure and self-employment, working in a licensed occupation, public sector employment, opportunity to work paid overtime, frequency of shift work, frequency of working on Sundays or public holidays, company size, occupation-share of Spätaussiedler and persons of Turkish origin, and finally visits of further-training workshops last year; $n_{2011\&2007} = 259,806$, $n_{2010\&2006} = 274,449$, $n_{2009\&2005} = 264,627$.

were born in Germany. Another question pertains gender differences. Supplementary Figure A.3 shows results of models that were separately estimated for women and men. Among the 1.5th generation our results are similar across genders. But in contrast to men, the estimated advantage pattern of 2nd generation women of Turkish origin is not significant. This might be in line with evidence about girls of Turkish origin doing better in school than boys (Fleischmann and Kristen, 2014), and could suggest that they are more successful in materializing their ambition. We suggested that income advantages stem from job-skill mismatches, i.e. minorities working in jobs they are not formally qualified for. The descriptives discussed above (Table 1) speak in favor of this assumption, with per-

sons of Turkish origin being up to 3.9 times more likely to be undereducated as compared to natives. This is of course reflected in their job profiles. According to the Microcensus unqualified natives work more often in elementary professions, the least-qualified ISCO88-categories. Unqualified persons of Turkish origin, by contrast, are overrepresented among machine operators and assemblers, drivers, and mobile plant operators. The ORU literature provides rich evidence according to which such undereducated employees earn less than their correctly-matched colleagues in the same occupation, but more than their correctly-matched peers with similar education (McGuinness, 2006). The testable implication of our claim is that if we decompose excess and missing years of education, we should be able to “explain away” the income benefits, i.e., there should be no ethnic differences in the returns to the *typically-required* years of education. The four panels of Figure 3 visualize the results.⁵ Indeed, there are hardly any differences in the income returns to the typically-required years of education. If we compare minorities and natives who work in jobs with similar educational profiles, we find no evidence for income advantages anymore.

Our overall patterns of findings strongly supports our theoretical model according to which dropping out of school is a strong negative signal among natives, but less so among immigrant minorities who tend to be disadvantaged in school because of poor language skills and lack of parental resources. As a consequence, school dropouts of Turkish origin work in jobs for which they are not formally qualified. Taking their likelihood to be undereducated into account via an ORU-decomposition can “explain away” their striking income benefits. As expected, this pattern is particularly pronounced for persons of Turkish origin whereas absent among Spätaussiedler, who are better endowed with supportive parental resources and language skills. Moreover, the 1.5th generation enjoys larger income advantages than the 2nd, for probably the same reasons.

While our theoretical model is not group or context specific, our empirical ev-

⁵The additional results for occupation-standardized over- and undereducation are displayed in Supplementary Figure A.4 and also show no ethnic differences.

idence only pertains to Spätaussiedler and persons of Turkish origin in Germany. A crucial question hence is whether our claims generalize beyond these theoretical test cases. A generalization to other countries is beyond the scope of this study, but a test whether our findings extend to comparable immigrant groups in Germany is not. To replicate our findings for the comparatively advantaged group of Spätaussiedler, we pool respondents who originate from affluent neighboring countries that did not have occupying troops in Germany and that have no history of sending poorly-qualified immigrants to Germany: Austria, Belgium, Denmark, Finland, Iceland, Lichtenstein, Luxembourg, the Netherlands, Norway, Sweden, and Switzerland. They should largely resemble the group of Spätaussiedler with regards to disadvantages at school. Indeed, Figure 4 shows highly similar findings compared to those of Spätaussiedler, including the imprecise estimates for 2nd generation dropouts. Furthermore, we extend our findings for persons of Turkish to those of Italian and Greek origin, because they also originate from typical former guest worker sending countries. For both we see a strikingly similar pattern of income advantages among dropouts. Alas for the small sample of persons of Greek origin the results are too imprecise to allow for statistically significant conclusions. But the estimated logged hourly personal income of dropouts are very similar: 2.09 (CI: ± 0.47) among the 1.5th generation of Greek as compared to 2.17 (CI: ± 0.13) among those of Turkish origin. Overall, this attests the generalizability of our theoretical model to comparable immigrant groups, at least in Germany.

Can more established theories of immigrant integration account for these findings? Online Appendix B discusses evidence and arguments against alternative explanations at length. Among others, we present evidence that our results hold for early-career employees of Turkish origin (i.e. who are 25 or younger and have less than five years of job experience), and for those who do not work in the ethnic economy (i.e. who are not self-employed, work for firms with more than 50 employees and in occupations with less than 10 or 5% co-ethnics, and live in rural areas). These findings speak against ethnic-niche employment and career trajectories as

Figure 4: Income returns to overall years of education for additional immigrant minority groups

Note: Estimates are from generalized additive models that control for: Age and age², gender, job experience (also squared), family status, number of children below 18, presence of pre-school children, settlement structure, year and federal state fixed effects, part-time work, tenure and self-employment, working in a licensed occupation, public sector employment, opportunity to work paid overtime, frequency of shift work, frequency of working on Sundays or public holidays, company size, occupation-share of Spätaussiedler and persons of Turkish origin, and finally visits of further-training workshops last year; $n_{2011\&2007} = 262,093$, $n_{2010\&2006} = 276,795$, $n_{2009\&2005} = 265,772$.

alternative explanations. Moreover, unemployment gaps among poorly-qualified persons of Turkish origin are not larger than among better-qualified ones, which suggests that the results are not driven by selection into employment. Finally, additional considerations of occupation and economic sector fixed effects render occupational segregation an unlikely alternative explanation. We also discuss alternative explanations that we cannot rule out empirically but only argue to be unlikely. Immigrant minorities might for instance rely on different search strategies, or get compensation for specific drawbacks of their jobs. The strongest argument in our favor is that no alternative explanation can explain the whole pattern of unearthed findings.

5 Conclusion

This study investigated counterintuitive implications of a modified version of the signaling model of discrimination. Against our tendency to regard poorly-qualified immigrant minorities as particularly disadvantaged, we argued that they likely enjoy income advantages due to positive discrimination. The underlying argument is that disadvantages in the educational system, which derive from insufficient language skills and their parents' lack of supportive resources, frequently prevent minority students from achieving educational qualifications that would reflect their comparatively high motivation and ambition. Their noticeable tendency for high non-cognitive skills (e.g. motivation, persistence and dependability) allow a substantial share of poorly-qualified immigrant minorities to work in jobs for which they would seem formally unfit.

We supported these claims with data from the German Microcensus by showing considerable income advantages among domestically-educated 1.5th and to a lesser extent 2nd generation school dropouts of Turkish origin. Spätaussiedler on the other hand, who are better endowed with parental resources and language skills, fare similar to German natives. Once we take into account that persons of

Turkish origin are more likely to work in jobs for which they are underqualified, by utilizing the ORU-decomposition methodology, we can explain any advantages. These findings extend to immigrant minorities that resemble persons of Turkish origin and Spätaussiedler. While alternative explanations might also predict one or the other of our findings, the overall pattern of our findings is hard to square without our argument – especially when we also consider the robustness tests discussed in online Appendix B. It thus appears that contrary to common reasoning, poorly-qualified persons of Turkish origin actually enjoy income advantages on the labor market, which yet again counter-intuitively arise from disadvantages in the educational system. Other factors shape the integration of persons of immigrant origin too, and arguably many of them are more decisive. But the substantial importance of our findings should not be dismissed as an idiosyncrasy given the large share of school dropouts among persons of immigrant origin.

Nevertheless, we do not directly observe the school-system and employment mechanisms that underlie our theoretical argument, but only their counterintuitive labor market consequences. We therefore hope that our article encourages future research probing into why poorly-qualified immigrant minorities have such better access to jobs for which they are formally underqualified. In particular, do poorly-qualified immigrant minorities have excess levels of non-cognitive skills and have employers made according experiences?

Moreover, the results extend to comparable immigrant minorities in Germany, but their applicability to other countries remains an open question. One might argue that disadvantaged immigrant minorities of other countries, such as persons of Mexican origin in the US or North African origin in France, are not comparable to those of Germany. But from all we know, persons of Turkish, Italian and Greek origin in Germany do not stand out in international comparison (e.g. Heath et al., 2007; Algan et al., 2010). Moreover, our results resemble findings from several European and North American countries about income advantages of foreign-educated poorly-qualified immigrants (e.g. Chiswick and Miller, 2010;

Anastassova, 2010; Hardoy and Schøne, 2014). Against this background, we believe that more can be learned from studying the conditions under which our argument applies. For instance, Germany is a country with a credentialist labor market and a vocationally oriented education system. Less credentialist labor markets might allow for even more undereducation among immigrant minorities, but then again Germany’s vocational orientation furthers skills among the less educated in international comparison (Heisig and Solga, 2015). Careful theorizing along such lines is needed and would limit inappropriate generalizations to other contexts and populations.

Apart from these substantial insights, we wish to highlight two theoretical implications of our study that are of general interest to scholars of stratification processes. First, our study cautions against the fallacy of assuming social disadvantages would simply sum up or reinforce each other. We laid out a social mechanism, supported by empirical evidence, that demonstrates how ethnic discrimination may mitigate educational disadvantages and turn them into a relative advantage. From a more systemic perspective one could also say the labor market partially counterbalances deficiencies of the educational system. Second, our study contributes to the literature on taste-based versus statistical discrimination. Evidence of statistical discrimination is largely based on tendencies for lower discrimination among more informed employers. We show that there are alternative strategies to identify implications arising from genuine statistical (but not taste-based) discrimination, if we distinguish between the different models of statistical discrimination and carefully link their abstract assumptions to established findings.

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Income Advantages of Poorly-Qualified Immigrant Minorities
Why School Dropouts of Turkish Origin Earn More in Germany

Online Appendices

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Online Appendix A: Additional information and sensitivity analyses

Figure A.1: Income returns to overall years of education; includes controls for occupation-share of Spätaussiedler and persons of Turkish origin that are interacted with the group and generation indicators

Note: Estimates are from generalized additive models that control for: Age and age², gender, job experience (also squared), family status, number of children below 18, presence of pre-school children, settlement structure, year and federal state fixed effects, part-time work, tenure and self-employment, working in a licensed occupation, public sector employment, opportunity to work paid overtime, frequency of shift work, frequency of working on Sundays or public holidays, company size, *occupation-share of Spätaussiedler and persons of Turkish origin that are interacted with the group and generation indicators*, and finally visits of further-training workshops last year; $n_{2011\&2007} = 259,806$, $n_{2010\&2006} = 274,449$, $n_{2009\&2005} = 264,627$.

Figure A.2: Ethnic income gaps by educational Casmin categories

Note: Estimates are from OLS models with robust standard errors and interaction terms to estimate how far income returns by Casmin categories of 1.5th and 2nd generation Spätaussiedler and Persons of Turkish origin differ from those of native Germans. The models control for: Age and age², gender, job experience (also squared), family status, number of children below 18, presence of pre-school children, settlement structure, year and federal state fixed effects, part-time work, tenure and self-employment, working in a licensed occupation, public sector employment, opportunity to work paid overtime, frequency of shift work, frequency of working on Sundays or public holidays, company size, occupation-share of Spätaussiedler and persons of Turkish origin, and finally visits of further-training workshops last year; $n_{2011\&2007} = 259,806$, $n_{2010\&2006} = 274,449$, $n_{2009\&2005} = 264,627$; 95% confidence intervals are capped at -1 and 0.5.

Figure A.3: Income returns to overall years of education by gender

Note: Estimates are from generalized additive models that control for: Age and age², job experience (also squared), family status, number of children below 18, presence of pre-school children, settlement structure, year and federal state fixed effects, part-time work, tenure and self-employment, working in a licensed occupation, public sector employment, opportunity to work paid overtime, frequency of shift work, frequency of working on Sundays or public holidays, company size, occupation-share of Spätaussiedler and persons of Turkish origin, and finally visits of further-training workshops last year; $n_{2011\&2007} = 256, 225$, $n_{2010\&2006} = 271, 262$, $n_{2009\&2005} = 261, 017$.

Figure A.4: Income returns to occupation-standardized years of over- and under-education

Note: Estimates are from generalized additive models that control for: Age and age², gender, job experience (also squared), family status, number of children below 18, presence of pre-school children, settlement structure, year and federal state fixed effects, part-time work, tenure and self-employment, working in a licensed occupation, public sector employment, opportunity to work paid overtime, frequency of shift work, frequency of working on Sundays or public holidays, company size, occupation-share of Spätaussiedler and persons of Turkish origin, and finally visits of further-training workshops last year; $n_{2011\&2007} = 259,806$, $n_{2010\&2006} = 274,449$, $n_{2009\&2005} = 264,627$.

Table A.1: Coding of educational certificates

Certificate according to the Microcensus	Years of education
<i>General schooling</i>	
Haupt-(Volks-)schulabschluss	9
Abschluss der Polytechnischen Oberschule der ehemaligen DDR	10
Realschulabschluss (Mittlere Reife)	10
Fachhochschulreife	12
Allgemeine oder fachgebundene Hochschulreife (Abitur)	13
<i>In-firm vocational training</i>	
Anlernausbildung oder berufliches Praktikum	1
Abschluss einer Lehrausbildung	3
<i>School-based vocational training</i>	
Berufsvorbereitungsjahr	0.5
Berufsqualifizierender Abschluss an einer Berufsfachschule/Kollegschule, Abschluss einer 1-jährigen Schule des Gesundheitswesens	2
Abschluss der Fachschule der DDR	3
Meister-/Techniker- oder gleichwertiger Fachschulabschluss, Abschluss einer 2- oder 3-jährigen Schule des Gesundheitswesens, Abschluss einer Fachakademie oder einer Berufsakademie	4
<i>Tertiary education</i>	
Abschluss einer Verwaltungsfachhochschule	3
Vorbereitungsdienst für den mittleren Dienst in der öffentlichen Verwaltung	3
Fachhochschulabschluss (auch Ingenieurschulabschluss)	4
Abschluss einer Universität (wissenschaftliche Hochschule, auch Kunsthochschule)	5
Promotion	8

Table A.2: Coefficients and standard errors of control variables relating to Figure 2 of the main text

Age	0.025*** (0.003)
Age ²	−0.000*** (0.000)
Women	−0.169*** (0.06)
Nr. of Children	0.059*** (0.002)
Presence of pre-school children	0.014* (0.006)
Marital status (reference: single)	
Married (spouse does not work)	0.167*** (0.004)
Married (spouse works part time)	0.077*** (0.003)
Married (spouse works full time)	0.009* (0.004)
Widowed	0.251*** (0.008)
Divorced	0.067*** (0.004)
Registered partnership	0.078 (0.066)
Settlement structure (reference: rural)	
City (> 20.000 inhabitants)	0.039*** (0.003)
Big city (> 500.000 inhabitants)	0.076*** (0.007)
Company size	0.004*** (0.000)
Job experience	0.012*** (0.001)
Job experience ²	−0.000*** (0.000)
Paid overtime	0.075*** (0.006)
Public service employment	0.001 (0.004)
Occupation-share employees of Turkish origin	−0.694*** (0.027)
Occupation-share Spätaussiedler employees	−0.694*** (0.028)
Licensed occupation	0.070*** (0.006)
Further training	0.073*** (0.002)
Part time work	0.050*** (0.007)
Shift work (reference: never)	
Rarely	−0.039*** (0.008)
Frequently	0.010 (0.005)
Constantly	0.025*** (0.005)
Tenure (reference: temporary)	
Tenured	0.133*** (0.005)
Self employed	0.110*** (0.016)
Work on Sundays or public holidays (reference: never)	
Rarely	0.016** (0.007)
Frequently	−0.031*** (0.008)
Constantly	−0.202*** (0.022)
Constant	1.330*** (0.053)
Federal state fixed effects	✓
Survey year fixed effects	✓

Note: $n_{2011\&2007} = 259,806$, $n_{2010\&2006} = 274,449$, $n_{2009\&2005} = 264,627$;

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Online Appendix B: Alternative explanations

While the idea of positive (statistical) discrimination motivates this study, there are plausible alternative explanations of our finding. Here we try to rule out five conceivable objections to the interpretation of our results, and discuss four further concerns as rather unlikely.

First, one of the most important and well-established explanations of how minorities fare in labor markets focuses on immigrant minorities' location in areas of particular productivity due to chain migration and the social capital generated in the ethnic communities of these areas (Portes and Rumbaut 2006, p. 85-93; Wilson and Portes 1980). While their location in areas of particular productivity cannot easily account for the access of persons of Turkish origin to jobs for which they seem underqualified, employment in the ethnic economy might. To rule out this alternative explanation, Figure B.1 visualizes estimates that exclude the self-employed, those working in firms with less than 50 employees and in occupations (by federal state and by settlement structure) with more than 10 or 5% persons of Turkish origin, and persons living in urban areas (cities with more than 50.000 inhabitants), since the ethnic economy is mostly an urban phenomenon and typically consists of companies with far fewer employees than 50 (Kontos, 2007). Even in this restrictive sample, which should entail only persons working in the general labor market, we find the same pattern of income advantages of poorly-qualified persons of Turkish origin, although the estimates are too imprecise among the 1.5th generation for statistical inference. Consider, however, how halving the occupation-share of peoples of Turkish origin from 10% to roughly their general population share only reduces the estimated log hourly personal income from 2.07 (CI: ± 0.52) to 1.96 (CI: ± 0.48); the estimate of the original analysis of the main text presented in Figure 2 was 2.17 (CI: ± 0.13). In conclusion, a more stringent definition of non-ethnic niche employment drives down the sample size but hardly the main results. A second, theoretically related, alternative explanation is related to the fact that immigrant minorities are segregated in certain occupations because of referral based job search networks. Additionally, there are collectively-bargained minimum wages in some of these occupations. If minorities were overrepresented in those, they in particular would be the beneficiaries of collective bargains. We maintain that if certain sectors or occupations were more attractive, it is in line with our argument that school dropouts of Turkish origin are more likely to find work in these areas. More importantly, both occupational segregation and occupation-specific minimum wages can hardly account for our finding that it is because of their underqualification that persons of Turkish origin generate higher personal income. Finally, if referral based job networks bring peo-

Figure B.1: Income returns to overall years of education, excluding self employed, persons working in firms with less than 50 employees and in occupations with more than 10 resp. 5% persons of Turkish origin, and living in urban areas

Note: Estimates are from generalized additive models that control for: Age and age², gender, job experience (also squared), family status, number of children below 18, presence of pre-school children, settlement structure, year and federal state fixed effects, part-time work, tenure and self-employment, working in a licensed occupation, public sector employment, opportunity to work paid overtime, frequency of shift work, frequency of working on Sundays or public holidays, company size, occupation-share of Spätaussiedler and persons of Turkish origin, and finally visits of further-training workshops last year; $n_{2011\&2007} = 93,634$, $n_{2010\&2006} = 94,937$, $n_{2009\&2005} = 90,701$.

ple into positions for which they are underqualified, employers must have made particularly good experiences with these “types” of workers in the past. Nevertheless, we also wish to present evidence against these concerns. Figure B.2 shows three rows of panels. The first row visualizes estimates that are adjusted for employment in 21 different economic sectors — operationalized as suggested by the Federal Statistical Office of Germany¹. The second row shows estimates that are adjusted for a two-digit operationalization of the ISCO88 occupation classification system, and the third row even includes fixed effects for both. These specifications account for any unobserved occupation and sector differences, but do not consider our argument about the respondents’ typically-required, over-, and undereducation. In line with our claims, all three rows show the same pattern of income advantages for school dropouts of Turkish origin. Even though hardly visible, the income advantages are even statistically significant for the 2nd generation in the third specification that takes for occupation and sector fixed effects into account. Third, one might be concerned about selection into employment. The competition to find a job might be so strong among school dropouts of Turkish (plus Italian and Greek) origin that only the very skilled and talented find work. Such highly selective persons might well make an unusually high income. Figure B.3 shows persons of Turkish origin’s unemployment gaps to natives by educational Casmin category. While persons of Turkish origin tend to be unemployed more frequently, there is no indication that this is particularly prevalent among school dropouts. This rules out selection into employment as alternative explanation. Fourth, one might wonder whether our findings are really the outcome of positive discrimination during the application process, as implied by statistical discrimination theory. Alternatively, the income advantages might evolve over the career as workers demonstrate their skills. We would argue that such career trajectories are not an objection to the core of our argument, but rather an alternative mechanism via which the same story unfolds of educational qualifications that do not reflect immigrant minorities’ non-cognitive skills. Nevertheless, it is an interesting alternative, which we can investigate only partially given the cross-sectional nature of our data. Figure B.4 displays results for a split sample of early-career employees who are aged 25 years or younger and work for their current employer for less than five years, as compared to later career employees. The idea of a career trajectory implies that we should find income advantages particularly among the older persons of Turkish origin. But this is not the case. Instead, we find income advantages among both early and later-career employees. The evidence is less clear for the 2nd generation, which is mostly a question of the small number of early-career employees among

¹http://www.gesis.org/missy/fileadmin/missy/klassifikationen/Amtliche_Klassifikationen/WZ/wz08.pdf

Figure B.2: Income returns to overall years of education, economic sector and occupation fixed effects

Note: Estimates are from generalized additive models that control for: Age and age², gender, job experience (also squared), family status, number of children below 18, presence of pre-school children, settlement structure, year and federal state fixed effects, part-time work, tenure and self-employment, working in a licensed occupation, public sector employment, opportunity to work paid overtime, frequency of shift work, frequency of working on Sundays or public holidays, company size, occupation-share of Spätaussiedler and persons of Turkish origin, and finally visits of further-training workshops last year; $n_{2011\&2007} = 259,806$, $n_{2010\&2006} = 274,449$, $n_{2009\&2005} = 264,627$.

Figure B.3: Ethnic employment gaps by educational Casmin categories

Note: Estimates are from linear probability models with robust standard errors that control for: Age and age², family status, settlement structure, number of children below 18, presence of pre-school children, year and federal state fixed effects; $n_{2011\&2007} = 381,825$, $n_{2010\&2006} = 386,292$, $n_{2009\&2005} = 373,974$.

them. While this is not conclusive evidence, it certainly does not speak against the possibility of positive statistical discrimination. Fifth, one could question our results from a classical Marxist perspective. According to Marx's (1867, Ch. 25) theory of the reserve army of (unemployed) labor, employers have an interest in a comparatively large population of unemployed workers so as to keep wages low. Inspired by this idea some argue that employers hire underqualified persons of immigrant origin to suppress wages in certain occupations (e.g. Portes, 1981). Under this scenario, we would also observe undereducated persons of immigrant origin having higher income than similarly qualified natives but less than their better qualified colleagues. What this argument lacks, however, is a reason why employers would need to hire undereducated persons of immigrant origin, and even more specifically immigrant origin from a former guest worker sending country; any undereducated employee helps to suppress wages. So if undereducated persons of immigrant origin are particularly favored, there must be additional factors that characterize them as attractive employees. The most likely candidate is our theory of access non-cognitive skills, i.e. persons of immigrant origin are particularly motivated, dependable and tenacious.

Despite these attempts to rule out alternative explanations, some limitations remain. First, we cannot rule out that natives, Spätaussiedler and persons who originate from affluent neighboring countries rely on different search strategies (i.e. via newspapers, employment agencies, or inter- or co-ethnic friends for example)

Figure B.4: Income returns to overall years of education by age and tenure

Note: Estimates are from generalized additive models that control for: Age and age², gender, job experience (also squared), family status, number of children below 18, presence of pre-school children, settlement structure, year and federal state fixed effects, part-time work, tenure and self-employment, working in a licensed occupation, public sector employment, opportunity to work paid overtime, frequency of shift work, frequency of working on Sundays or public holidays, company size, occupation-share of Spätaussiedler and persons of Turkish origin, and finally visits of further-training workshops last year; $n_{2011\&2007} = 255,248$, $n_{2010\&2006} = 269,795$, $n_{2009\&2005} = 260,128$.

than persons of Turkish, Italian and Greek origin. Yet, according to Lancee (2015) various types of search strategies do not account for differences in persons of immigrant origins' earnings in Germany, only whether they have native friends does. Moreover, given that we find no evidence for ethnic niche employment, it is not easily imaginable how people of Turkish, Italian and Greek origin should rely on a search strategy that makes them find jobs for which they are unqualified more frequently, without also being more skilled than natives and Spätaussiedler. This renders different search strategies as unlikely. Second, more problematic is the fact that Spätaussiedler are probably less easily recognized by employers than persons of Turkish origin. As co-ethnic Germans they often have German names and are phenotypically also not distinguishable from native Germans. This questions our interpretation of Spätaussiedler as a test case of persons of immigrant origin who are endowed with better language skills and parental resources, which should enable them to actually materialize their ambition and aspirations. Their income returns, which mimic the ones of native Germans, might simply reflect employers inability to identify and classify them. The most important argument against this concern are the similar findings for persons who originate from affluent neighboring countries. In addition we would like to point out that in such a situation income advantages of Spätaussiedler should at least develop over their career, once their higher skills and ambition are being recognized and merited. Yet, this is not what we see. Third, we cannot totally rule out that the salaries of persons of Turkish immigrant origin also compensate for specific drawbacks of their jobs. We already control for many potential drawbacks such as the frequency of work on Sundays and public holidays and the frequency of shift work. But we cannot directly rule out all drawbacks. Consider for example garbage men who have to deal with smelly garbage or mine workers who do not get much sunlight. Note, however, that our occupation and economic sector fixed effects robustness check probably accounts for many additional unobserved drawbacks. In addition, we would like to mention another argument that speaks against drawbacks as alternative explanation. We showed that the reason why school dropouts of Turkish enjoy income advantages lies in the fact that they work in jobs for which they seem unqualified. Now if there were drawbacks that kept similarly low qualified German natives from doing these jobs, why would better-educated natives be willing to do them? Taken together we thus conclude that drawbacks are also an unlikely alternative explanation. Finally, one might be concerned with systematic non-response among school dropouts of Turkish, Italian and Greek origin (but not among Spätaussiedler and persons originating from affluent neighboring countries, which already renders the concern as unlikely). The Microcensus is the best data source to alleviate these concerns.

Participation is compulsory and sanctioned with fines of up to €5000.² If a person cannot answer another household member will have to answer for them. This explains the Microcensus' response rate of 97%.³

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²www.destatis.de/DE/Methoden/Rechtsgrundlagen/Statistikbereiche/Inhalte/010_BStatG.pdf?__blob=publicationFile

³www.gesis.org/missy/en/studie/faq/methodische-fragen/sonstiges/