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ABSTRACT

Dissimilation? The Educational Attainment of Second-Generation Immigrants*

The educational attainment of second-generation immigrants is of crucial importance for their subsequent labour market success in Germany. While the schooling outcomes of natives improved in recent decades, German-born children of immigrants did not participate in this development. The Paper applies representative data from the Mikrozensus and the German Socioeconomic Panel (GSOEP) to investigate the development and determinants of educational attainment of immigrant youth. Even after controlling for covariate effects, the time trends in the educational attainment of natives and second generation immigrants deviate. This evidence for 'dissimilation' calls for responses by educational policy and further research attention. An additional outcome of the study is that the analysis of immigrant educational attainment ought to distinguish first- and second-generation immigrants as these groups differ in statistically significant ways.

JEL Classification: I21, J24 and J61
Keywords: assimilation, cohort effects, educational attainment and second generation immigrants

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NON-TECHNICAL SUMMARY

Children of immigrants make up increasing shares of the population in most OECD countries. Typically these second-generation immigrants have more problems entering the labour market than natives: their unemployment rates are higher, and they are less likely to invest in continuous education. In countries with highly structured educational and vocational training institutions, such as Germany, the schooling attainment of second-generation immigrants is of crucial importance for their subsequent employment opportunities and labour market success.

In recent decades the schooling outcomes of native German youth have improved steadily. The first question addressed in this research is whether German-born children of immigrants participated in this improvement of educational outcomes across cohorts. Since aggregate statistics on school leavers provide evidence by nationality only and without differentiating by country of birth, this analysis draws on individuals' survey data from two sources: first, data from the German *Mikrozensus* are applied, which is a representative 1% sample of German households with large numbers of observations but few variables, and second, the German Socioeconomic Panel (GSOEP) is used with fewer observations but richer sets of describing characteristics for each observation. It is shown for the first time here that the share of immigrant birth cohorts attaining high schooling degrees increasingly lags behind that of natives, and that the share of immigrant birth cohorts attaining low or no schooling degrees continues to surpass natives'. Thus immigrants are not participating in the improvements of schooling outcomes.

The study investigates the development and determinants of educational attainment of immigrant youth in more detail. Even after controlling for other factors however, the time trends in the educational attainment of natives and second generation immigrants deviate. Only when immigrants' country of origin is controlled for in the estimations does the significant negative cohort effect for second generation immigrants vanish. This suggests that the continued divergence between native and second-generation immigrants' educational success is possibly correlated to immigrants' nationality composition.

The second question addressed in this study points to a shortcoming in the existing literature on immigrant educational attainment. Existing studies fail to distinguish between those born in Germany and first-generation immigrants. It is shown here that there are significant differences between these two groups. Therefore it is important to consider the distinction by place of birth when investigating educational outcomes of young immigrants, as otherwise results are obscured and less reliable.

The general evidence for ‘dissimilation’ presented in the cohort-specific distributions across educational groups calls for further research attention and responses by educational policy. While the migration literature until now has focused on testing assimilation effects, this study shows that even when assimilation is taking place over individual life courses, the overall differences between population groups can grow. In the case of immigrants the consequences of social exclusion based on their nationality might be particularly grave, as the return to ethnic groups and possibly ethnic enclaves may foster social disintegration.

Given the already high population share of immigrants in Europe and the projected population movements following the enlargement of the European Union, it is important to pay attention to educational and social ‘dissimilation’ processes. Most OECD countries experienced vast improvements in the educational achievement of youth. These trends may differ significantly between natives and immigrants, however.

1. Introduction

Children of immigrants make up increasing shares of the population in most OECD countries. While these second generation immigrants have more problems entering the labor market than natives, it is generally concluded that assimilation takes place and eventually immigrants do about as well as natives. This paper questions the "assimilation conviction" dominating migration research, and examines whether educational outcomes for native and immigrant cohorts indeed converge over time.

Also investigating developments over time Borjas (1985) pointed to the relevance of cohort effects. He showed that the qualification of subsequent immigrant cohorts to the United States declined relative to natives'. In consequence the assimilation effects found previously on the basis of cross-sectional data (e.g. Chiswick 1978) had to be adjusted downwards: The earnings advantage of immigrants from earlier years compared to more recent immigrants was only in part due to assimilation, as earlier immigrants were more highly qualified.[1]

Similar in spirit, this study focuses on the development of the educational attainment of immigrant relative to native youth over the last decades. This contributes to the literature on schooling outcomes in three ways. First, this is the first time that cohort effects in school attainment are compared for immigrants and natives. Surprisingly, the possibility of "dissimilation" trends between these groups has not been discussed in a literature, which looks at educational success and its determinants in a rather static framework. While public debates are increasingly concerned about the declining quality of immigrants' education and its far-reaching consequences, this has not yet received scientific attention.

Second, in addition to filling this gap in the literature, this paper utilizes two representative datasets to study immigrants to Germany, the main destination country for migration to Europe (Zimmermann 1995). The data provide large samples and detailed control variables. Finally, existing studies on immigrant educational attainment failed to distinguish between first and second generation immigrants. It is shown here that this obscures the results and that there are significant differences between the two groups.

Given the already high population share of immigrants in Europe and the projected population movements following the enlargement of the European Union, it is important to pay attention to educational and social "dissimilation" processes. Most OECD countries experienced vast improvements in the educational achievement of youth (OECD 2000). However, these trends might differ significantly between natives and immigrants.

The paper proceeds as follows: **Section 2** briefly introduces the German educational system and describes the evidence on school attainment based on official statistics. **Section 3** surveys theoretical models of educational attainment and formulates testable hypotheses. Applying *Mikrozensus* data for the first time in this literature, **section 4** describes the development of the second generation's educational attainment relative to natives', and tests the robustness of the time trends. Since the *Mikrozensus* is strong on sample size but weak on available information, **section 5** uses the rich German Socioeconomic Panel data to test whether the results of prior studies, which mixed first and second generation immigrants, are biased by neglecting the groups' differences. **Section 6** concludes.

2. Institutional Background and Aggregate Developments

The German school system introduces differentiated educational tracks already after four grades of primary education. These tracks differ in academic orientation and requirements. The basic school (*Hauptschule*) graduates individuals after six years of secondary education and is traditionally a preparation for blue collar occupations. The middle school (*Realschule*) also lasts six years and trains for white collar employment. The highest track (*Gymnasium*) offers nine

years of schooling and a degree (*Abitur*), which is a precondition for academic studies.[2] Depending on the track, pupils typically finish school aged 16 or 19. In 1997, 7 percent of all school leavers had no degree, 25 percent graduated from basic school, 38 percent from middle school, and 22 percent from *Gymnasium* (the rest in the "other" category).

Figure 1 shows the distribution of school leavers in West Germany across school types, and by the year when they left school. Figure 1(a) describes natives, and Figure 1(b) looks at foreign youth, combining first and second generation immigrants.[3] We find clear differences between natives and immigrants: The share of pupils who recently left school with an advanced degree (*Abitur*) is about 25 percent for natives and below 9 percent for foreign youth. Close to 20 percent of foreign youth left school without a degree in contrast to only 7 percent of native pupils. So at the end of the 1990s native youth' overall educational attainment is still higher than immigrants'. Given the importance that the German labor market attaches to formal degrees this is crucial for subsequent labor market opportunities (Gang and Zimmermann 2000).

Natives and immigrants also differ in the development of educational attainment over time: As of 1970 two thirds of natives left school with no or only a basic degree. This figure dropped by 50 percent (or 35 percentage points) to one third by 1998. As of 1970 more than 80 percent of foreign youth were in that category. This share declined by only about 25 percent (or 21 percentage points) to about 60 percent of foreign youth in 1998. Thus educational progress has been more pronounced for natives than for foreign youth.

Since official data does not permit the analysis of first versus second generation immigrants, we apply *Mikrozensus* and German Socioeconomic Panel data to investigate the educational attainment of second generation immigrants. The next section surveys theoretical models from which relevant hypotheses are derived.

3. Models of Educational Attainment

To clarify the theoretical background for the empirical analysis and to guide the interpretation of the findings, this section surveys the modelling approaches used in studies on the educational attainment of immigrant children. Three approaches can be distinguished.[4]

Going back to Becker (1981) the child quantity vs. child quality model explains the parental choice regarding the number of children and the human capital invested in each as a function of prices and income. The model hypothesizes a quality-quantity tradeoff, which has been confirmed in numerous studies.[5] Parents are more likely to invest in child education, rather than in a higher number of offspring, the higher parental wages and the (opportunity) cost of child care, the higher housing costs, and the lower the cost of contraception. The model predicts different fertility patterns based on parental earnings, human capital, and cultural preferences. Gang and Zimmermann (2000) apply a related model of parental choice and additionally hypothesize that demand for education is determined by assimilation to a host country's culture, differences in social capital, and the amount of social support received from an ethnic group.

The role of ethnicity is stressed by Borjas (1992, 1994), who introduces the concept of ethnic capital as an externality in a child investment model. Ethnic capital is modelled as the average skill level in the parent generation of a child's ethnic group. Borjas finds that the skills of young migrants "depend not only on the skills and labor market experiences of their parents, but also on the average skills and labor market experiences of the ethnic group in the parents' generation." (1992, p.148). This suggests that characteristics of ethnic groups, or at least belonging to a given ethnic group, might explain part of child educational attainment.

The third theory of education is the optimal schooling model (Chiswick 1988, Becker 1967). Here, the optimal amount of schooling is determined by the intersection of schooling demand and supply schedules. The location of the demand schedule varies with individual

ability, and its slope reflects the (decreasing) return from additional years of schooling. The location of the schedule for supply of educational investments is determined by the availability of funds and its slope reflects the (increasing) marginal cost of funding additional years of schooling. Ethnic differences in optimal schooling can arise from different locations and slopes of the schedules, e.g. due to different tastes for schooling and discount rates of future consumption. Stronger tastes and lower discount rates yield a cheaper provision of investment funds and a downward shift of the supply curve. Chiswick (1988) suggests that demand schedules vary more across groups than supply schedules. Therefore ethnic differences may predominantly be determined by varying productivities and returns to education, rather than by tastes and discount rates. Differences in the productivity of education may result from parental investments or ethnic influences, which should therefore be considered in empirical models of educational attainment. Leslie and Drinkwater (1999) apply this model and show that ethnicity affects the consumption value of education as well as the expected income after training.

These models suggest that educational attainment is influenced by factors such as parental income and human capital, by measures of assimilation, and effects of ethnicity, such as the support received from an ethnic network, or the ethnic groups' capabilities. We focus on cohort effects in the educational attainment of immigrants; these additional factors may represent possible explanations for changing outcomes over subsequent birth cohorts.

4. Evidence from *Mikrozensus* Data

4.1 Descriptive Statistics

The *Mikrozensus* is an annual cross-sectional survey of 1 percent of German households, i.e. about 370,000 households with 820,000 persons. It contains information on issues such as demographics, education, and labor force participation. We use the 70 percent random sample taken from the 1995 *Mikrozensus*, as available from the Federal Statistical Office.

Given information on nationality and country of birth, we calculated the population shares of all and of second generation immigrants. Figure 2 describes the situation as of 1995. Overall 9.1 percent of the population were foreign citizens, a share which reached its maximum at 18 percent for the 23 year olds (Figure 2(b)). As of 1995 second generation immigrants accounted for about half of the foreign population below age 20 and made up over 10 percent of the enire population among infants. Large immigration in recent years (cf. Figure 2(c)) suggests that the population share of second generation immigrants is to rise even further in the future.

To compare educational attainments, we defined three groups of individuals, who were born between 1960, the first sizeable second generation immigrant cohort, and 1974, when the last were born who could finish school by 1995. 104,001 natives are classified based on German nationality. 1,195 second generation immigrants are characterized by birth in Germany and a foreign nationality. First generation immigrants are not German and born abroad (7,998 individuals). Unfortunately information on the parental place of birth is not available.[6]

Table 1 provides evidence on the distribution of natives, first, and second generation immigrants across different schooling degrees.[7] The educational attainment of the three population groups differs substantially. First, immigrants have a much higher risk of not completing a degree than natives. Among the completed degrees the basic *Hauptschul*-degree is particularly frequent for these groups. Second, medium level degrees are more frequent among natives than among immigrants. Finally, natives have a higher propensity to graduate with the advanced degree. Tabulations by sex yield similar conclusions, where immigrant men are somewhat more likely to receive basic and females more likely to receive higher degrees.

Table 1(b) lists the educational attainment of immigrants who are born abroad by age at migration. The literature tends to assume that individuals who immigrate through age 16 can be

considered as second generation (e.g. Gang and Zimmermann 2000). Table 1(b) allows one to evaluate this hypothesis. Overall, the earlier the child entered the German educational system, the higher the attained degree. The sensitivity of schooling degrees to age at migration suggests that pooling first and second generation immigrants introduces noise to the data.

To evaluate the trends in school attainment across cohorts Figure 3 presents the cohort shares of natives and second generation youth, who obtained no or a basic schooling degree and the highest (*Abitur*) degree. The graphs confirm the educational improvement among natives, where the cohort share with low degrees declined, and the share with the advanced degree increased constantly. Among second generation immigrants the share with a low or no degree is much higher and does not drop. Similarly, the cohort share obtaining the *Abitur* degree does not seem to follow the natives' trend. Next we investigate whether these developments can be explained by individual characteristics.

4.2 Multivariate Analysis

The objective of the multivariate analysis is to provide a more formal test of differential trends in the school attainment of native and second generation immigrants. We apply the 1995 *Mikrozensus*, which is the only dataset immediately representative of the German population.

The dependent variable is an ordered categorical indicator of individuals' schooling degree. No degree and basic school degree jointly represent the first category, the mid category combines the medium degree, the polytechnical degree, and the *Fachhochschulreife (FHR)*, as described above. The highest ranking category is the *Abitur*. The distribution of the dependent variable by population group is described in Table 2(a).[8] Table 2(b) presents descriptive statistics on the covariates, separately for the native and second generation samples.

Following the literature on educational attainment four groups of explanatory variables are considered: First, we control for year of birth, and second generation status. If an interaction of these measures yielded a significant negative coefficient this would suggest that relative to natives, second generation immigrants experienced slower improvements in their educational attainment over time. To test the robustness of such a result we control for demographic indicators, for assimilation effects, and country of origin differences. If cohort effects disappear after these controls are included, the controls might be correlated with or even causal for the observed developments. The literature suggests that educational achievements are higher in households that are more assimilated to the host country culture (see e.g. Haisken-De New et al. (1997)). Since years since migration - the standard assimilation measure - is not relevant for German born immigrants, we use home country family ties as assimilation indicator. Ideally one would control for parental human capital (see Gang and Zimmermann (2000), or van Ours and Veeman (2000)), however, this measure is not available in the *Mikrozensus*.

The regression is estimated for 105,196 observations using an ordered probit model. The results are presented in Table 3. In model (1) only a linear cohort effect, a control for second generation status and an interaction of the two are considered. The significant negative coefficient on the interaction term indicates a slower improvement in the educational attainment of second generation immigrant cohorts compared to the steep positive slope found for natives. This effect is robust to the consideration of additional explanatory variables in models (2) and (3), which thus do not explain the development. In columns (4) and (5) the linear cohort term is replaced by a quadratic effect and a set of birth year indicators (with the 1972-74 cohorts as reference group). Tests yield that even in these flexible specifications there are significant differences in cohort effects for natives and second generation immigrants. The significant difference in the two samples' cohort effect disappears when country of origin indicators are considered in the model (see column 6). This suggests that the nationality composition of

immigrants is a main determinant of diverging trends in educational attainment.[9] Ethnicity differences may capture various effects, among them variation in the cultural value of education, expected returns, and household liquidity constraints.

When the estimates of columns (1) through (5) are used to predict the educational attainment of the samples born in 1960 versus 1974, natives' probability to graduate with a low degree falls by about 10 percentage points over time and the probability of higher degrees increases. For immigrants the development is reversed, where the probability of a low degree increased by about 2 percentage points, and that of attaining higher degrees declinded.[10]

The coefficients of the control variables confirm the results of prior studies: Females, East German residents, and those living in large cities have on average higher degrees, and those with strong ties to the home country have lower degrees. The positive effect of having children at home is surprising. However, there are only three individuals in this category, who possibly came to Germany exactly in order to receive training and qualified labor market experience.

A number of robustness tests confirmed the results. Models estimated by gender corroborate that second generation immigrants' educational advancement lags behind that of natives. This effect disappears when country of origin controls are considered. Thus the multivariate analysis confirms the differential development of educational achievement for natives and second generation immigrants.

5. Analysis of GSOEP Data

5.1 Data and Stylized Facts

Since 1984 the GSOEP gathers annual information on demographic, labor market, and other variables. The data cover the German population and an oversample of guestworkers[11] and other immigrants. Individuals are grouped here based on country of birth and nationality:

1.	Native	German nationality, born in Germany
2.	First generation immigrant	foreign nationality, not born in Germany
3.	Second generation immigrant	foreign nationality, born in Germany
4.	Other	German nationality, not born in Germany.

Table 4 describes the distribution of all observations, independent of age, across groups and schooling degrees. Natives have the highest share of individuals with advanced degrees followed by second generation immigrants. The high share of immigrants without a degree (32.4 and 20.7 percent) may partly be due to the young age of this subsample (see last column of Table 4), where not everybody has yet completed a formal education.

Using the *Mikrozensus* data we found significant differences in the educational attainment of subsequent cohorts of natives and immigrants. Before investigating these differences further, we repeat the analysis with GSOEP data. Again, the dependent variable considers three categories of educational attainment. The sample consists of 6,784 natives and 595 second generation immigrants, born between 1960 and 1979.[12] Column 1 in Table 5 presents ordered probit estimation results paralleling specification (1) in Table 3. We do not find individually significant estimates of immigrant cohort effects, but the coefficients describing second generation immigrants are jointly significant at the one percent level.[13] – Since educational attainment has been addressed in prior studies on Germany that literature is briefly summarized, before we describe our empirical approach.

5.2 Existing Literature

The German literature on immigrant education takes a static approach, which does not pay attention to changes over time or cohorts. Instead the studies investigate the determinants of

the type of school attended,[14] the highest schooling degree attained, or the number of years of schooling (Gang and Zimmermann 2000, below referred to as GZ). They focus on assimilation, parent human capital, and ethnicity to explain educational choices, and apply GSOEP data. The main findings are (1) household assimilation in customs, language, or time since migration, helps improve youth educational attainment, and (2) parental ability and degrees are positively correlated with child attainment (not confirmed by GZ). The studies do not separate first and second generation immigrants. Even though e.g. GZ interpret their results as descriptive for second generation immigrants, their immigrant sample contains youth, who entered the country up through age 16. Other studies use observations on youth aged thirteen and only control for the nationality of the head of household as immigrant indicator (Büchel and Wagner 1996, Haisken-DeNew et al. 1997). These procedures might cause considerable measurement error.

Wolter (1996) uses employment register data to disentangle whether the increased share of qualified foreign workers is due to improved qualification of those already in Germany or to the inflow of trained persons. He finds no evidence of the former, confirming the concern about whether immigrant human capital indeed assimilates to natives' over time. – Except for this last paper, there has been no study discussing developments over time in immigrant qualification.

5.3 Empirical Approach and Estimation Results

Approach: Following the literature, educational attainment is modelled as a function of birth cohort, and demographics, such as sex, health and whether the individual has completed secondary education at the time of the survey. GZ found all of these measures to significantly affect youth educational attainment. Our controls for assimilation to the host country consider whether the immigrant acquired a German passport, whether the youth speaks and writes German well, and how many years the parents spent in Germany before the individual was born. Since all immigrants in our sample were born in Germany, the classic "years since migration" measure is not applicable. For those ten percent of our sample, for whom "years since parents' migration" is missing, the variable is coded as zero and a "missing value" indicator is applied.

Following GZ we control for whether either of the parents has at least a basic school degree, and additionally consider whether parents completed a vocational degree. We also follow GZ in measuring the size of an individuals' ethnic group at age 6, to test whether larger ethnic networks support youth educational attainment. Since statistics on ethnic networks are not available for all nationalities back through the 1960s, we again use missing value indicators. Ordered probits are estimated for natives and second generation immigrants born 1960-1979.

Second Generation Results: Some of the results in Table 6 confirm for second generation immigrants what has been known before for combined first and second generation immigrant samples. The significant difference in developments over the subsamples' subsequent cohorts holds up to the controls in model (2) and disappears, just as above, when country of origin indicators are considered.

Similar to Büchel and Wagner (1996) but in contrast to GZ, we find significantly lower schooling for men than for women. The effect is (insignificantly) larger among immigrants than among natives.[15] Poor health reduces the educational success of natives, and being in school is correlated with significantly lower educational degrees.

Several assimilation measures are highly significant. However, in contrast to GZ we find no significant impact of whether an individual took on German nationality. As shown below, this is a consequence of focusing strictly on second generation immigrants instead of mixing generations. Among second generation immigrants, educational success appears to be correlated particularly with the ability to *speak* German, while the writing ability effect is statistically

insignificant.[16] The jointly significant "years since household migration" effect suggests that early parental migration is positively correlated with educational success. The maximum benefit can be reached if birth occurs over 20 years after parental migration, confirming Haisken-DeNew et al. (1997) and GZ.

Given their importance in child investment models, the significance of parent human capital, which was not available for the *Mikrozensus* regressions, is not surprising. The main effects of parental degrees are highly significant and positive. Confirming GZ we find that fathers' schooling has a more sizeable and significant impact than mothers', and the effect of mothers' vocational training is larger than fathers'. However, estimations by subsample show that parent education is significant only for natives. This corroborates the finding of GZ, who conclude that the first generation's human capital is completely depreciated upon migration.

The findings on ethnicity effects differ somewhat from those presented by GZ. Network size itself is not significant, but the missing value indicator is positively correlated with educational attainment. Since only nine individuals are covered by this latter measure, who mostly originate from neighboring countries like Austria or Belgium, the variable is in fact a grouped nationality indicator. Additional nationality indicators in specification 4 are highly significant as well, but do not affect other coefficients in important ways.

First versus Second Generation Immigrants: Throughout this paper we have argued that it is important to separate first and second generation immigrants in the analysis of educational attainment. Table 4 showed that more than 40 percent of first generation immigrants had schooling degrees classified as *other*. Thus already the definition of a meaningful dependent variable for all three subsamples is difficult. To test whether the covariate effects differ for first and second generation immigrants, we reestimated model 3 in Table 5 including first generation immigrants with low, medium or advanced schooling degrees in the sample. "Immigrant" interaction terms are added for both generations, and the second generation indicators are maintained.

The main findings of the estimations are presented in Table 6 are as follows: Even in a fully interacted model we find significantly different effects of sex and German writing ability for first and second generation immigrants. Also, the joint effects of German language ability (speaking and writing) is significantly different for the two groups. Taking on German nationality is statistically significant only after first generation immigrants are added to the sample (cf. Table 5). The effect of parental vocational training on educational attainment is similar for natives and first generation immigrants, but jointly significantly different for second generation immigrants. Thus there are clear differences in the determinants of educational attainment for first and second generation immigrants.

5.4 The Naturalization Issue

If the decision to take up German citizenship is correlated with educational attainment, the divergence in educational attainment between natives and second generation immigrants might be due to endogenous selection: Possibly those immigrants with low degrees remain in the second generation immigrant sample while those with higher degrees naturalized.

Unfortunately we have only very limited information to gauge how naturalizations could affect the results. Figure 4 plots the share of naturalized immigrants in the stock of non-naturalized immigrants by year and nationality. The naturalization rate varied substantially across nationalities: While the average never exceeds five percent, the rates for Italians, Greeks, and those from former Yugoslavia always remain below one percent. Independent of year and nationality the share of minors among the naturalized was close to 30 percent.[17] Regrettably we

have no information on the education of individuals taking up German nationality.

Figure 4 shows that through 1994 no more than one percent of the immigrants from the relevant countries obtained German citizenship in any given year.[18] Since most of these naturalizations concerned individuals beyond the agegroups that we are interested in (who may well be first generation immigrants) we can safely assume that our results through 1994 are unaffected by naturalizations. In 1994 the 1975 / 76 cohorts finished the advanced degree and the 1977 / 78 cohorts completed school with lower or medium degrees. For later birth cohorts selection may influence the results, as naturalization rates went up (mostly for Turks).[19] However, the results in Table 3 show that significantly slower advancements in educational degrees already concerned the early cohorts. Therefore it is unlikely that our results are due to selective naturalizations.

6. Conclusions

This study analyses the educational attainment of second generation immigrants to Germany. The focus is first on the relative development in native and immigrant schooling attainments over time, and second on the importance of separating first and second generation immigrants in this literature.

Three data sources were used. German aggregate statistics do not permit the analysis of immigrants by place of birth. However, aggregate trends indicate that foreign youth did not partake equally in recent improvements in native educational advancements. This conclusion is strengthened using data from the *Mikrozensus* survey, a representative one percent sample of the German population with evidence available for first and second generation immigrants, separately. For the latter we find significantly slower educational advancement than for natives. This finding is confirmed in multivariate analyses, and only disappears when controls for immigrant nationalities are considered. Then we analysed data provided by the German Socioeconomic Panel. The results corroborate the divergence in educational attainment over time for native and second generation immigrant youth, as well as the main results in the literature on educational attainment. We find significant differences in the determinants of educational attainment for first and second generation immigrants.

The remaining challenge is to *explain* in detail the divergence in educational developments for native and second generation immigrant youth. The pursuit of three aspects might be fruitful: First, in times of heightened unemployment immigrants are overall more affected by job loss than natives. The related decline in disposable incomes might have contributed to increasingly binding liquidity constraints, which in the framework of the optimal schooling model reduce funds investible for education.[20] Second, while Lauer and Steiner (2000) show that the returns to education were remarkably stable for the entire German population over the last decades, there might well be cohort effects for immigrants. Third, expected returns to education - and with them incentives to invest in education - may have fallen indirectly through rising youth unemployment rates for immigrants.[21] While overall youth unemployment is comparatively low in Germany, it is concentrated among immigrant youth, who have the greatest difficulties in school to work transitions (Riphahn 2001).

Independent of the mechanisms driving the observed "dissimilation" process, educational attainment is of paramount importance for youth labor market opportunities (OECD 2000). This concerns not only second generation immigrant youth directly, which will make up ever increasing shares of European populations. Also, the demographically induced future shortage of human capital calls for attention to the education of all population groups. The findings presented here dispute the assumption that assimilation will run its course and eventually children of natives and immigrants will end up being indistinguishable, a point

questioned also in the US sociological literature (e.g. Portes 1996, Portes and Rumbaut 1996). Instead, the challenge for educational policies is to prevent the development of a new and increasingly *"dissimilated"* underclass of the children of immigrants.

References

Alba, Richard D., Johan Handl, and Walter Müller, 1994, Ethnische Ungleichheiten im deutschen Bildungssystem, *Kölner Zeitschrift für Soziologie und Sozialpychologie* 46(2), 209-237.

Becker, Gary S., 1967, *Human Capital and the Personal Distribution of Income*, Woytinsky Lecture No. 1. University of Michigan Press, Ann Arbor Michigan

Becker, Gary S., 1981, *A Treatise on the Family*, Harvard University Press, Cambridge, Mass.

Borjas, George J., 1985, Assimilation, Changes in Cohort Quality, and the Earnings of Immigrants, *Journal of Labor Economics* 3(4), 463-489.

Borjas, George J., 1992, Ethnic Capital and Intergenerational Mobility, *Quarterly Journal of Economics* 107(1), 123-150

Borjas, George J., 1994, Immigrant Skills and Ethnic Spillovers, *Journal of Population Economics* 7(2), 99-118.

Büchel, Felix and Gert G. Wagner, 1996, Soziale Differenzen der Bildungschancen in Westdeutschland - Unter besonderer Berücksichtigung von Zuwandererkindern, in: W. Zapf et al., *Lebenslagen im Wandel: Sozialberichterstattung im Längsschnitt*, Campus, Frankfurt a. M., 80-96.

Chiswick, Barry R., 1978, The Effect of Assimilation on the Earnings of Foreign-Born Men, *Journal of Political Economy* 86(5), 897-921.

Chiswick, Barry R., 1988, Differences in Education and Earnings across Racial and Ethnic Groups: Tastes, Discrimination, and Investments in Child Quality, *Quarterly Journal of Economics* 103(3), 571-597.

Duleep, Harriet Orcutt and Mark C. Regets, 1999, Immigrants and Human Capital Investment, *American Economic Review* 89(2), 186-191.

Gang, Ira N. and Klaus F. Zimmermann, 2000, Is Child Like Parent. Educational Attainment and Ethnic Origin, *Journal of Human Resources* 35(3), 550-569.

Haisken-DeNew, John P., Felix Büchel, and Gert G. Wagner, 1997, Assimilation and Other Determinants of School Attainment in Germany: Do Immigrant Children Perform as Well as Germans?, *Vierteljahreshefte zur Wirtschaftsforschung* 66(1), 169-79.

Lauer, Charlotte and Viktor Steiner, 2000, Returns to Education in West Germany - An Empirical Assessment, *ZEW Discussion Paper* No. 00-04, Mannheim.

Leslie, Derek and Stephen Drinkwater, 1999, Staying on in Full-Time Education: Reasons for Higher Participation Rates among Ethnic Minority Males and Females, *Economica* 66(261), 63-77.

OECD (Organization for Economic Co-operation and Development), 2000, *Education at a Glance*, Paris.

Portes, Alejandro, 1996, Introduction: Immigration and Its Aftermath, in: Alejandro Portes (ed.), *The new second generation*, Russell Sage Foundation, New York, 1-7.

Portes, Alejandro and Ruben G. Rumbout, 1996, *Immigrant America. A Portrait*, University of California Press, Berkeley, second edition.

Riphahn, Regina T., 2000, Immigrant Participation in Social Assistance Programs: Evidence from German Guestworkers, *mimeo*.

Riphahn, Regina T., 2001, Residential Location and Youth Unemployment: The Economic Geography of School-To-Work Transitions, forthcoming. *Journal of Population Economics.*

Sweetman, Arthur and Gordon Dicks, 1999, Education and Ethnicity in Canada. An Intergenerational Perspective, *Journal of Human Resources* 34(4), 668-696.

van Ours, Jan C. and Justus Veenman, 2000, Second Better Than First? On the Educational Attainment of Second-Generation Immigrants in the Netherlands, *mimeo*.

Wolter, Achim, 1996, Determinanten des Qualifikationsanstieges unter den Ausländern in der IAB-Beschäftigtenstichprobe, *Mitteilungen aus der Arbeitsmarkt- und Berufsforschung* 29(4), 616-629.

Zimmermann, Klaus F., 1995, Tackling the European Migration Problem, *Journal of Economic Perspectives* 9(2), 45-62.

Table 1 Distribution of Schooling Degrees By Population Group (Cohorts 1960-74)

(a) Three Population Groups

Subsamples	No	Basic	Medium	Polyt.	FHR	Advanced	N
Native	5.50	27.61	24.74	13.56	4.79	23.80	104001
Second Generation	11.72	46.19	20.50	2.50	2.43	18.91	1195
First Generation	19.20	46.47	13.45	3.40	2.60	17.93	7998

(b) First Generation Immigrants by Age of Migration

Age at Migration	No	Basic	Medium	Polyt.	FHR	Advanced	N
0 - 5	11.78	52.76	20.23	0.10	3.44	11.68	959
6 - 15	19.51	61.17	11.98	0.00	1.13	6.21	1594
16 - 35	20.42	41.07	12.69	0.48	2.88	22.46	5445

Source: Own calculations based on *Mikrozensus* 1995 data.

Table 2 Descriptive Statistics: Multivariate *Mikrozensus* Analysis

(a) Distribution of the Dependent Variable

Category	Explanation	Natives	Second Gen.	First Gen.	All
1 low	no or basic school	33.2	57.9	65.7	35.7
2 medium	three medium school types	43.1	23.2	16.4	41.0
3 high	*Abitur* (advanced school)	23.8	18.9	17.9	23.3

(b) Explanatory Variables

	Natives		Second Generation Immigrants	
	Mean	Stand. Dev.	Mean	Stand. Dev.
Birthcohort: (Birthyear - 1900)/ 10	6.638	0.414	6.995	0.381
Born 1960 - 62	0.222	0.416	0.063	0.243
Born 1963 - 65	0.230	0.421	0.095	0.293
Born 1966 - 68	0.217	0.412	0.145	0.352
Born 1969 - 71	0.186	0.389	0.240	0.427
Born 1972 - 74	0.145	0.352	0.458	0.498
Demographic Effects				
Female	0.494	0.500	0.459	0.499
Living in East Germany	0.176	0.381	0.003	0.058
Living in Small City (< 20.000)	0.428	0.495	0.215	0.411
Living in Large City (> 500.000)	0.148	0.355	0.264	0.441
Assimilation Effects				
Partner in Home Country	-	-	0.011	0.104
Parent in Home Country	-	-	0.023	0.149
Children in Home Country	-	-	0.003	0.050
Country of Origin				
Turkey	-	-	0.399	0.490
Former Yugoslavia	-	-	0.128	0.334
Italy	-	-	0.151	0.358
Greece	-	-	0.121	0.326
Other	-	-	0.202	0.401
Number of Observations	104001		1195	

Source: Own calculations based on Mikrozensus 1995.

Table 3 Estimation Results: Ordered Probit on Educational Degree Attained (MZ)

	1	2	3	4	5	6
Second Generation (0/1)	1.282 *	1.502 *	1.415 *	-1.748	-.678 **	-1.610 *
	(.627)	(.629)	(.631)	(10.904)	(.052)	(.719)
Birthcohort	.215 **	.226 **	.226 **	1.820 **	-	.226 **
	(.008)	(.008)	(.008)	(.289)		(.008)
Birthcohort * Second Gen.	-.263 **	-.300 **	-.286 **	.609	-	.071
	(.089)	(.090)	(.090)	(3.203)		(.101)
Birthcohort ^ 2	-	-		-.119 **		
				(.022)		
Birthcohort ^ 2 * Second Gen.	-	-		-.063		
				(.235)		
Born 1960 - 62 (0/1)	-	-	-	-	-.251 **	-
					(.012)	
Born 1963 - 65 (0/1)	-	-	-	-	-.169 **	-
					(.012)	
Born 1966 - 68 (0/1)	-	-	-	-	-.088 **	-
					(.012)	
Born 1969 - 71 (0/1)	-	-	-	-	-.009	-
					(.012)	
Born 1960 - 62 * Second Gen.	-	-	-	-	.316 *	-
					(.147)	
Born 1963 - 65 * Second Gen.	-	-	-	-	.351 **	-
					(.122)	
Born 1966 - 68 * Second Gen.	-	-	-	-	.031	-
					(.105)	
Born 1969 - 71 * Second Gen.	-	-	-	-	.193 *	-
					(.086)	
Demographic Effects						
Female (0/1)	-	.085 **	.085 **	.085 **	.085 **	.085 **
		(.007)	(.007)	(.007)	(.007)	(.007)
Living in East Germany	-	.366 **	.366 **	.367 **	.367 **	.366 **
		(.009)	(.009)	(.009)	(.009)	(.009)
Living in Small City	-	-.306 **	-.306 **	-.305 **	-.305 **	-.306 **
		(.008)	(.008)	(.008)	(.008)	(.008)
Living in Large City	-	.270 **	.270 **	.269 **	.269 **	.270 **
		(.011)	(.011)	(.011)	(.011)	(.011)
Assimilation Effects						
Partner in Home Country	-	-	-.709 ▫	-.711 ▫	-.724 ▫	-.415
			(.383)	(.384)	(.386)	(.395)
Parent in Home Country	-	-	-.386	-.390	-.382	-.622 *
			(.247)	(.247)	(.248)	(.258)
Children in Home Country	-	-	1.241 ▫	1.225 ▫	1.141	1.296 ▫
			(.724)	(.725)	(.727)	(.713)
Country of Origin Controls	No	No	No	No	No	Yes **
Log Likelihood	-112 209.1	-109 956.8	-109 953.1	-109 937.6	-109 940.6	-109 865.7

Note: 1. **, *, and ▫ indicate statistical significance at the 1, 5, and 10 percent confidence level.
2. Birthcohort interaction terms in specification 4 are jointly significant at the 5 percent level.
3. Threshold parameters not reported to save space.

Table 4 Schooling Degree by Nationality / Country of Birth

Group	Obs.	---- Low ---- None	Haupts.	Middle Reals.	--- Advanced --- FHR	Abitur	---- O/M ---- Other	Missg.	Average year of birth
Native	18114	4.1	47.4	30.4	3.1	13.2	1.0	0.9	1949
First Gen.	4159	32.4	15.8	3.1	1.1	2.1	44.3	1.2	1952
Second Gen.	744	20.7	39.7	21.2	3.6	9.8	3.6	1.3	1971
Other	911	10.3	23.2	11.8	2.3	7.8	43.6	1.0	1953
All	23928	9.8	40.7	24.6	2.8	11.0	10.3	0.9	1950

Source: Own calculations based on GSOEP (1984-1998).

Table 5 Estimation Results: Ordered Probit on Educational Degree Attained (GSOEP)

	Descrip. Statistics	1	2	3	4
Cohort Effects					
Second Generation (0/1)	.087	-12.87	-26.66 *	-20.54	-22.43 ¤
	(.283)	(12.44)	(13.08)	(13.71)	(13.85)
Birthcohort (i.e. calendar year - 1900) / 10	6.818	1.494 *	.560	.571	.571
	(.536)	(.684)	(.711)	(.713)	(.713)
Birthcohort Squared / 100	46.776	-.118 *	-.057	-.059	-.059
	(7.405)	(.050)	(.052)	(.052)	(.052)
Birthcohort * Second Generation	.631	3.522	7.405 *	5.760	6.241
	(2.039)	(3.509)	(3.687)	(3.866)	(3.901)
Birthcohort Squared / 100 * Second Gen.	4.556	-.249	-.517 *	-.401	-.443
	(14.807)	(.247)	(.259)	(.272)	(.274)
Demographic Effects					
Male (0/1)	.492	-	-.109 **	-.098 **	-.098 **
	(.500)		(.028)	(.029)	(.029)
Male * Second Generation (0/1)	.0.45	-	-	-.144	-.136
	(.207)			(.104)	(.105)
Disabled (0/1)	.054	-	-.230 **	-.261 **	-.261 **
	(.227)		(.063)	(.066)	(.066)
Disabled * Second Generation (0/1)	.006	-	-	.320	0.342 ¤
	(.080)			(.204)	
Still in school (0/1)	.017	-	-.784 **	-.790 **	-.790 **
	(.128)		(.128)	(.135)	(.135)
Still in school * Second Gen. (0/1)	.002	-	-	.072	.056
	(.047)			(.420)	(.420)
Assimilation Effects					
Obtains German passport * Sec. Gen. (0/1)	.003	-	-.078	.110	.112
	(.051)		(.289)	(.296)	(.298)
Speaks German well (0/1)	.973	-	.474 **	.487 **	.529 **
	(.161)		(.168)	(.169)	(.171)
Writes German well (0/1)	.966	-	-.004	.025	-.037
	(.180)		(.155)	(.156)	(.157)
Years since hh. migrated[3] * Sec. Gen.	0.501	-	.065	.061	.058
	(1.999)		(.041)	(.040)	(.040)
Years since hh. migrated ^2 * Sec. Gen.	4.245	-	-.002	-.002	-.001
	(22.956)		(.003)	(.002)	(.002)
Years since hh. mig. missg. * Sec. Gen. (0/1)	.008	-	-.051	-.103	-.077
	(.089)		(.229)	(.230)	(.234)

Parental Human Capital					
Father: at least basic schooling degree (0/1)	.929	-	.217 **	.208 *	.208 *
	(.256)		(.075)	(.097)	(.097)
Mother: at least basic schooling degree (0/1)	.922	-	-.034	.076	.076
	(.268)		(.076)	(.102)	(.102)
Father: some vocational degree (0/1)	.768	-	.153 **	.144 **	.144 **
	(.422)		(.038)	(.041)	(.041)
Mother: some vocational degree (0/1)	.608	-	.485 **	.515 **	.516 **
	(.488)		(.033)	(.034)	(.034)
Father: at least basic sch. deg. * Sec.Gen. (0/1)	.057	-	-	-.062	-.094
	(.232)			(.158)	(.160)
Mother: at least basic sch. deg. * Sec.Gen.(0/1)	.045	-	-	-.131	-.180
	(.206)			(.157)	(.159)
Father: vocational degree * Sec. Gen (0/1)	.038	-	-	-.0004	-.025
	(.191)			(.119)	(.123)
Mother: vocational degree * Sec. Gen. (0/1)	.016	-	-	-.527 **	-.563 **
	(.125)			(.144)	(.149)
Ethnicity Effects					
Ethnic group size at age 6 * Sec.Gen. (in Mio.)	.062	-	.042	.028	.508
	(.241)		(.131)	(.133)	(.438)
Ethnic group size at age 6 missg. * Sec.G.(0/1)	.001	-	.965 *	1.124 *	1.291 **
	(.032)		(.458)	(.469)	(.495)
Country of origin controls	-	No	No	No	Yes **
μ_1	-	4.26	1.74	1.91	1.89
		(2.35)	(2.44)	(2.45)	(2.45)
μ_2	-	5.39	2.92	3.10	3.08
		(2.35)	(2.44)	(2.45)	(2.45)
Log Likelihood	-	-7151.79	-6921.66	-6909.51	-6902.46
Joint test: 3 second generation cohort indicators	-	85.75 **	7.17 ¤	2.36	3.28

Note:

1. Descriptive statistics on interaction terms present statistics for second generation sample, not the overall average, to help interpretation. Presented are means and standard deviations in parentheses.
2. The total number of observations is 6,784, of which 595 are second generation immigrants, and 6,189 are natives.
3. The variable "years since household migrated" measures the number of years the household spent in the country before the birth of the individuals: birth year - migration year.
4. The variable "Ethnic group size at age 6" measures the number of persons of the individuals' country of origin present in Germany when the individual was 6 years old.
5. **, *, and ¤ indicate statistical significance at the 1, 5, and 10 percent confidence level, standard errors in parentheses.

Table 6 Ordered Probit estimation on joint sample of natives, first, and second generation immigrants

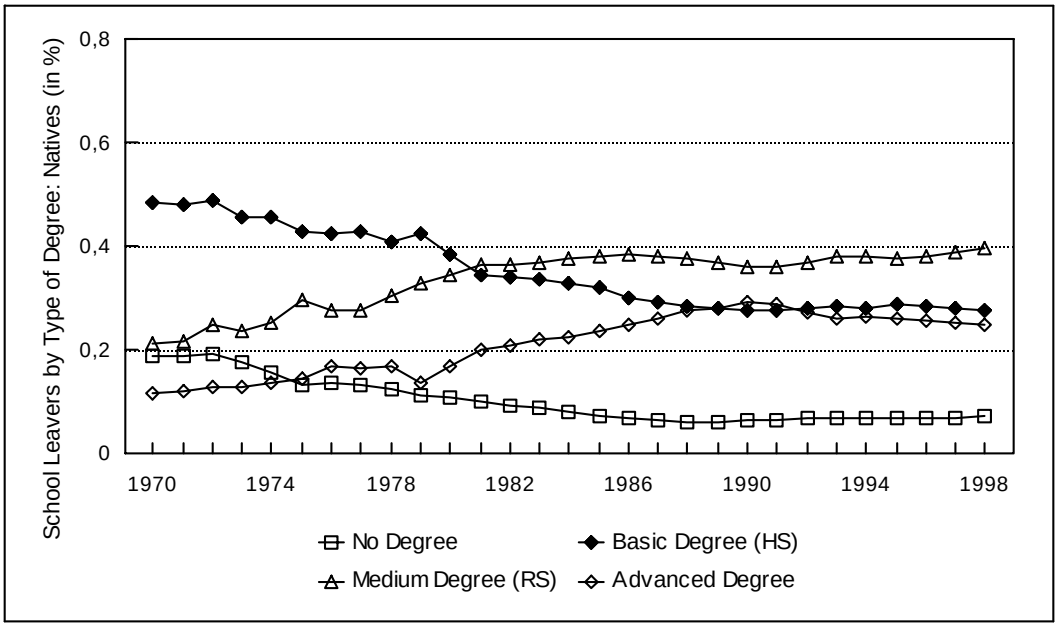
	Coeff.	St. Error
Cohort Effects		
Immigrant (0/1)	-11.391	11.889
Second Generation (0/1)	-8.550	17.811
Birthcohort (i.e. (calendar year - 1900) / 10)	0.057	0.071
Birthcohort Squared	-0.058	0.052
Birthcohort * Immigrant	0.292	0.348
Birthcohort Squared / 100 * Immigrant	-0.187	0.253
Birthcohort * Second Generation	0.274	0.510
Birthcohort Squared / 100 * Second Generation	-0.207	0.364
Demographic Effects		
Male (0/1)	-0.096	0.029 **
Male * Immigrant (0/1)	0.235	0.101 *
Male * Second Generation (0/1)	-0.378	0.139 **
Disabled (0/1)	0.259	0.066 **
Disabled * Immigrant (0/1)	0.173	0.192
Disabled * Second Generation (0/1)	0.143	0.264
Still in school (0/1)	-0.781	0.135 **
Still in school * Immigrant (0/1)	-0.089	0.663
Still in school * Second Generation (0/1)	0.163	0.761
Assimilation Effects		
Obtains German passport * Immigrant (0/1)	0.734	0.312 *
Obtains German passport * Sec. Generation (0/1)	-0.625	0.432
Speaks German well * Immigrant (0/1)	0.112	0.158
Writes German well * Immigrant (0/1)	0.612	0.163 **
Speaks German well * Sec. Generation (0/1)	0.352	0.232
Writes German well * Sec. Generation (0/1)	-0.580	0.226 **
Years since hh. migrated^2 * Immigrant	0.045	0.013 **
Years since hh. migrated^2 squared * Immigrant	0.000	0.002
Years since hh. migrated^2 missg. * Immigrant (0/1)	0.146	0.143
Years since hh. migrated^2 * Sec. Generation	0.016	0.042
Years since hh. migrated^2 squared * Sec. Generation	-0.002	0.003
Years since hh. migrated^2 missg. * Sec. Generation (0/1)	-0.249	0.271
Parental Human Capital		
Father has at least basic schooling degree (0/1)	0.205	0.097 *
Mother has at least basic schooling degree (0/1)	0.075	0.102
Father has some vocational degree (0/1)	0.141	0.041 **
Mother has some vocational degree (0/1)	0.508	0.341 **

Father has at least basic sch. deg. * Immigrant (0/1)	-0.124	0.150
Mother has at least basic sch. deg. * Immigrant (0/1)	0.122	0.158
Father has vocational degree * Immigrant (0/1)	-0.100	0.118
Mother has vocational degree * Immigrant (0/1)	-0.105	0.157
Father has at least basic sch. deg. * Sec.Generation (0/1)	0.063	0.169
Mother has at least basic sch. deg. * Sec.Generation (0/1)	-0.251	0.169
Father has vocational degree * Sec. Generation (0/1)	0.102	0.157
Mother has vocational degree * Sec. Generation (0/1)	-0.414	0.207 *
Ethnicity Effects		
Ethnic group size at age 6 * Immigrant (in Mio.)	-0.00023	0.00017
Ethnic group size at age 6 missg. * Immigrant (0/1)	0.378	0.198 ¤
Ethnic group size at age 6 * Sec. Generation (in Mio.)	0.00026	0.00022
Ethnic group size at age 6 missg. * Sec. Generation (0/1)	0.732	0.510
Country of origin controls	No	
μ_1	2.122	2.443
μ_2	3.267	2.443
Log Likelihood	-7495.398	

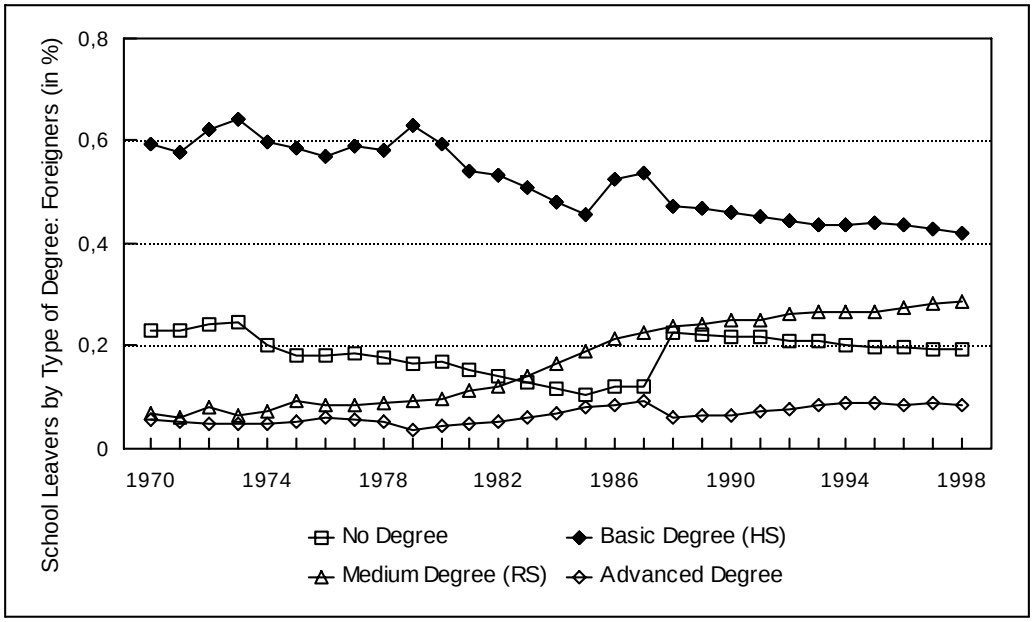
Note:

1. The total number of observations is 7,767, of which 595 are second generation immigrants, 983 are first generation immigrants and 6,189 are natives.
2. The variable "years since household migrated" measures the number of years the household spent in the country before the birth of the individuals: birth year - migration year.
3. The variable "Ethnic group size at age 6" measures the number of persons of the individuals' country of origin present in Germany when the individual was 6 years old.
4. **, *, and ¤ indicate statistical significance at the 1, 5, and 10 percent confidence level, standard errors in parentheses.

Figure 1 School Leavers in West Germany by Year, Type of Degree, and Nationality
(a) Natives



(b) Foreigners

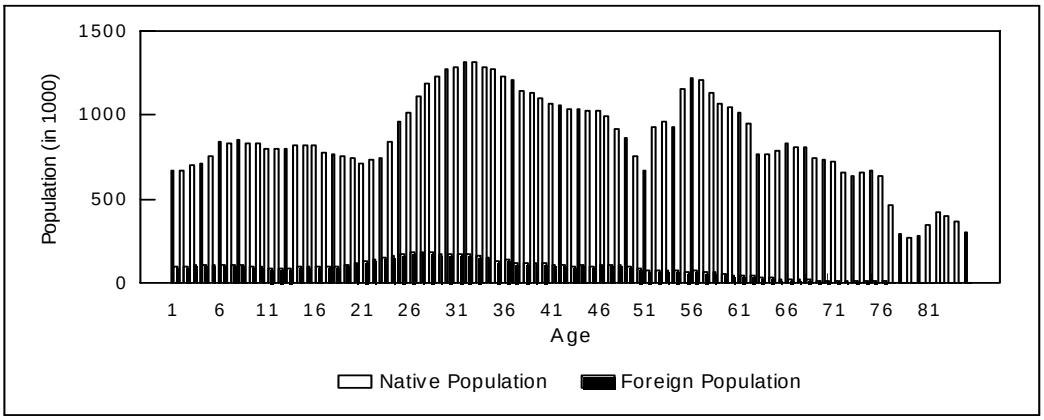


Note: The nationality split between native and foreign school leavers prior to 1988 is imputed by applying the nationality of pupils currently in school to the total number of school leavers for each year and school type.

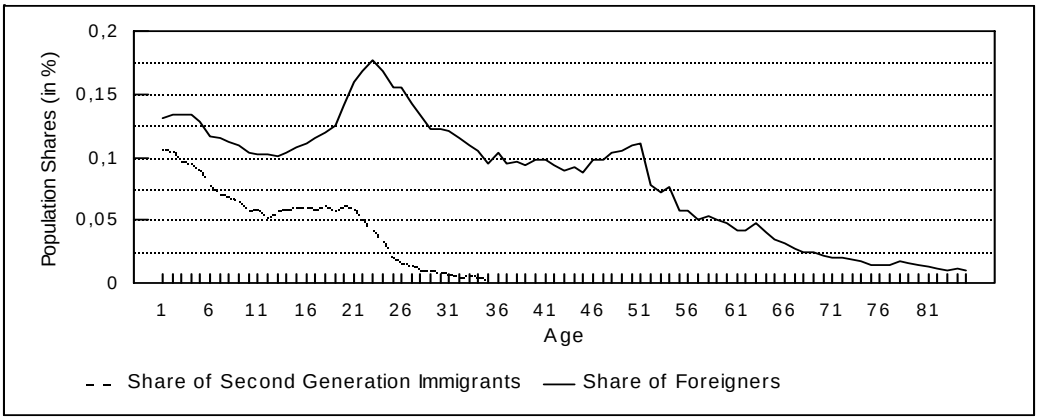
Source: Own calculations based on figures taken from Statistisches Bundesamt, Fachserie 11, Reihe 1, various years.

Figure 2 Number and Population Share of Immigrants as of 1995

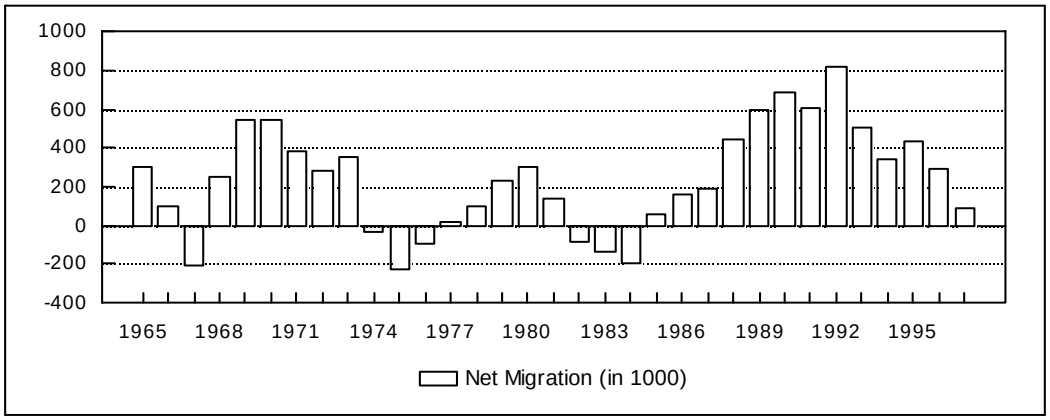
(a) Absolute Number



(b) Population Share



(c) Net Migration

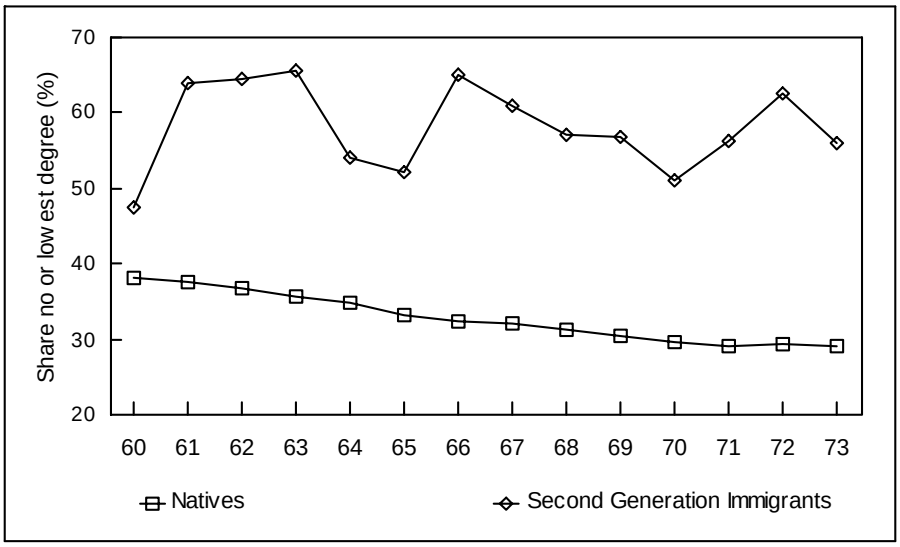


Note: The population of Germans might contain immigrants who took on German nationality.

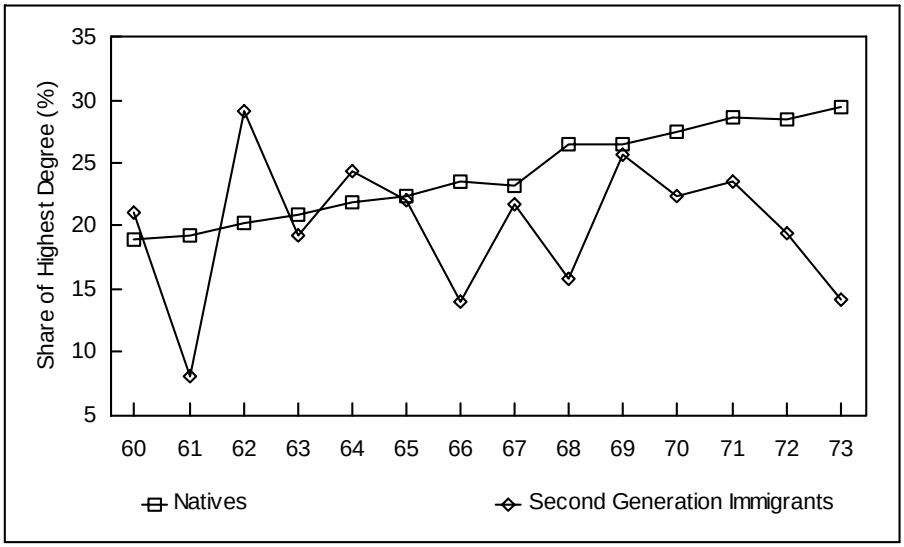
Source Information on age-specific population by age and nationality as of Dec. 31, 1995 by fax from German Federal Statistical Office. Population share of second generation immigrants calculated based on share of second generation foreigners in all foreigners, by age (from 1995 Mikrozensus) * Population share of foreigners (Statistical Office Data). Net migration data own calculations based on Statistical Yearbooks, various years.

Figure 3 Cohort Shares

(a) No or Basic School (*Hauptschul*) Degree

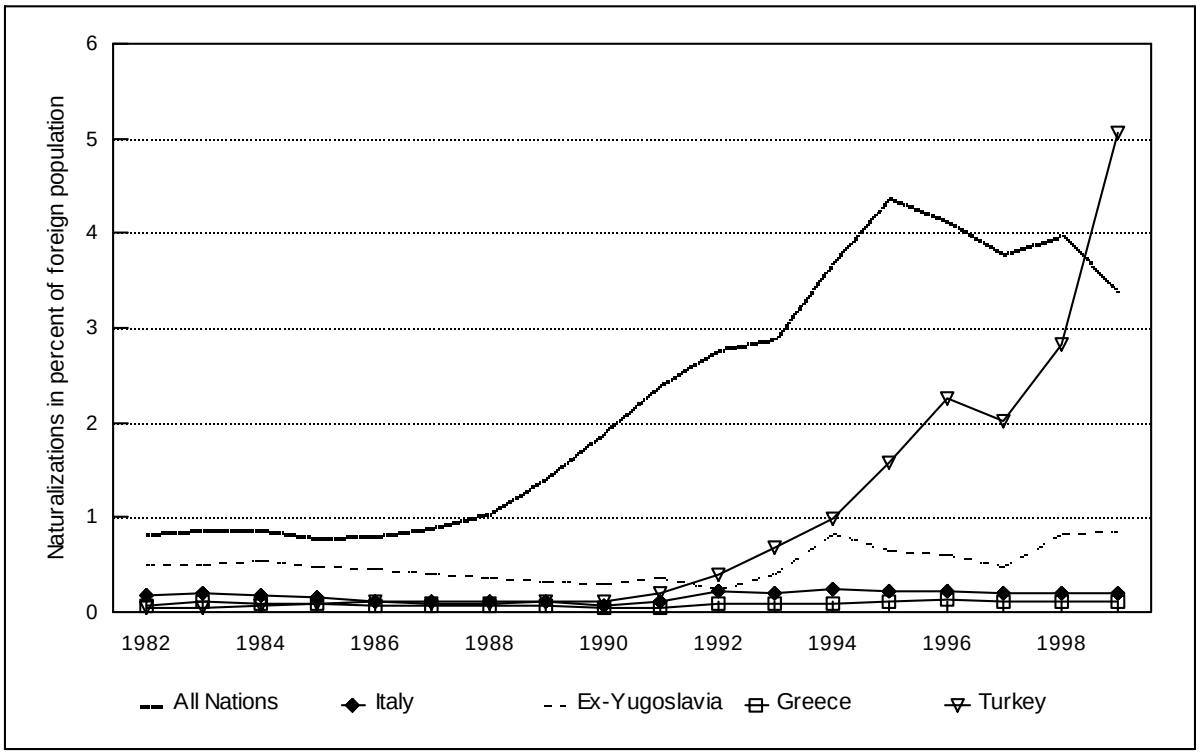


(b) Advanced School (*Abitur*) Degree



Source: Own calculations based on *Mikrozensus* 1995.

Figure 4 Trends in Naturalization over Time



Source: Own calculations based on data taken from Statistical Yearbooks (various years). Data on the naturalization of Greek nationals is obtained directly from the federal statistical office.

1. For a new perspective on these issues see Duleep and Regets (1999) and studies cited there.

2. Further, comprehensive schools (*Gesamtschule*) introduced in the 1970s grant degrees of either track.

3. German official statistics record only nationality and not the country of birth. Thus first and second generation immigrants cannot be distinguished in administrative data.

4. For recent studies see e.g. Gang and Zimmermann (2000), Sweetman and Dicks (1999), Borjas (1992, 1994) and the literature cited there.

5. See Sweetman and Dicks (1999) for references, and Chiswick (1988) for a description of the model.

6. Thus second generation immigrants *could* be third generation as well. –The question on *individual* place of birth is not part of the mandatory questionnaire and 8 percent of the sample did not provide this information and were not used in the analysis. To the degree that this is nonrandom, the sample's representativeness is affected. As this is the only source of place of birth information it is impossible to provide cross-validation. However, missing data on 8 percent of the total share might still be small enough to avoid major biases.

7. The degree categories described above are complemented here by the "polytechnical school degree," which was awarded only in East Germany before unification, and *Fachhochschulreife* (*FHR*), which typically those in the highest schooling track receive, who do not complete the advanced (*Abitur*) degree.

8. Given that degree categories differ by years of schooling *and* quality of education the ordered estimation approach appears more natural than a least squares regression on 'years of schooling' recodes of the degrees.

9. The indicators applied here distinguish former Yugoslavian, Greek, Italian, and "other" nationalities, with Turks as the reference group. The coefficients are individually and jointly statistically significant. Educational attainment is lowest for Turks and highest for Greek and "other" nationalities.

10. The predictions are generated as averages of predicted degree probabilities over all observations using the observed characteristics, with the cohort variables set either to the value 1960 or to 1974.

11. Guestworkers are labor migrants who came to Europe between the late 1950s and early 1970s. Originally they were to stay only temporary, but eventually most brought their families and only few returned home.

12. The second generation immigrant sample contains 27 percent Turks, 17 percent citizens of former Yugoslavia, 20 percent Greeks, 22 percent Italians and 15 percent other nationalities. Due to missing values on the dependent variable 2.5 percent of native and 4.9 percent of the immigrant observations were dropped.

13. When only linear effects are estimated the coefficients are not individually significant either. However, jointly the second generation variables are significant at the one percent level and the

interaction term is negative.

14. See e.g. Alba et al. (1994), Büchel and Wagner (1996), or Haisken-DeNew et al. (1997).

15. Tests on gender differences for given nationalities yielded no statistically significant effects.

16. The language indicators might be considered endogenous to the attained degree. However, in that case one would expect a significant positive effect of writing rather than speaking German. Also, test runs show that the remaining results do not change when the language indicators are omitted.

17. This is based on own calculations using data from annual statistical yearbooks. At the end of 1995 the share of youth under age 20 in the foreign population in Germany amounted to about 28 percent. If this ratio is stable over recent years, the naturalization rate among youth about matches their share in the foreign population.

18. See Table 2(a) for the Mikrozensus nationality composition and footnote 12 for the GSOEP data.

19. The interaction effect of the variable "obtains German passport" with the indicator for Turkish nationality yielded a positive coefficient but was not statistically significant.

20. Since the early seventies immigrants' unemployment rates exceed their population share. The effect on disposable income is evidenced by this groups' high and disproportionate dependence on welfare (Riphahn 2000).

21. Official statistics provide scarce information on this point: whereas in 1975 the share of unemployed youth in all unemployed was higher among natives than among immigrants, this has been reversed ever since.