

Are there Diverging Time Trends in the Educational Attainment of Nationals and Second Generation Immigrants?

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The educational attainment of second generation immigrants is of crucial importance for their subsequent labor market success in Germany. While the schooling outcomes of Germans improved in recent decades, German-born children of immigrants did not partake 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 nationals and second generation immigrants deviate. These different developments over time seem to be related to the changing nationality composition of second generation immigrants in Germany.

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1. Introduction

Children of immigrants make up increasing shares of the population in most OECD countries. We know that second generation immigrants have more problems entering the labor market than natives and public debates at times suggest a growing division between the educational attainments of natives and immigrants as a group. This paper investigates whether there is evidence for divergent educational outcomes of native and immigrant cohorts over time.

A similar question was posed by Borjas (1995) who analyzed the development of immigrant qualifications over time, and pointed to the relevance of cohort effects among immigrants. He showed that the qualification of subsequent immigrant cohorts to the United States declined relative to natives'. I focus on the educational attainment of subsequent cohorts of immigrant youth relative to their national counterparts in Germany over the last decades.

This contributes to the literature on schooling outcomes in three ways. First, this study is among the first comparing cohort effects in school attainment for immigrants and nationals. Surprisingly, the possibility of diverging trends between these groups has not been discussed in a literature, which looks at educational success and its determinants in a rather static framework. In contrast, public debates are increasingly concerned with the declining quality of immigrants' education. Second, 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 nationals and immigrants.

The paper proceeds as follows: Section 2 introduces the German educational system and describes the evidence on school attainment using official statistics. It reviews the relevant empirical literature, surveys theoretical approaches, and formulates hypotheses. Section 3 then introduces the two datasets and discusses the definition of national and immigrant population groups and its limitations. Section 4 then presents descriptive statistics and estimation results on the educational attainment using both data from the German *Mikrozensus* and the German Socioeconomic Panel. This section also tests whether the results of prior studies, which mixed first and second generation immigrants, are biased by neglecting the groups' differences. Section 5 concludes.

2. Institutions, Hypotheses, and the Literature

2.1 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.¹ Depending on the track, pupils typically finish school aged 16 or 19. In the late 1990s, 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).

¹ Further, comprehensive schools (*Gesamtschule*) introduced in the 1970s grant degrees of either track.

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 nationals, and Figure 1(b) looks at foreign youth, combining first and second generation immigrants.² We find clear differences between nationals and immigrants: The share of pupils who recently left school with an advanced degree (*Abitur*) is about 25 percent for Germans 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 German pupils. So at the end of the 1990s German 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).

Nationals and immigrants also differ in the *development* of educational attainment over time: As of 1970 two thirds of Germans 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 German than for foreign youth. However, since official data does not permit the analysis of first versus second generation immigrants, we apply microdata to investigate the educational attainment of second generation immigrants.

2.2 Models of Educational Attainment

To clarify the theoretical background for the empirical analysis and to guide the interpretation of the findings, this section summarizes modeling approaches used in studies on

² German official statistics record only nationality and not the country of birth. Thus first and second generation immigrants cannot be distinguished in administrative data.

the educational attainment of immigrant children.³

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.⁴ 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 model was developed further in the optimal schooling model by Chiswick (1988). 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

³ For recent studies see e.g. Gang and Zimmermann (2000), Sweetman and Dicks (1999), Borjas (1992, 1994), Chiswick and DebBurman (2003) and the literature cited there.

⁴ See Sweetman and Dicks (1999) for references, and Chiswick (1988) for a description of the model.

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.

A somewhat different approach is presented Borjas (1992, 1994), who emphasizes the role of ethnicity and introduces the concept of ethnic capital as an externality in a child investment model. Ethnic capital is modeled 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.

These models suggest that educational attainment is influenced by factors such as parental income and human capital, by measures of assimilation, and ethnicity, such as the support received from an ethnic network, or the ethnic groups' capabilities.

2.3 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,⁵ 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

⁵ See e.g. Alba et al. (1994), Büchel and Wagner (1996), or Haisken-DeNew et al. (1997).

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.

3. Data and Definition of Subsamples

3.1 Data

Our analysis takes advantage of two representative German datasets. The German *Mikrozensus*, provides a large number of observations with only few explanatory variables whereas the German Socioeconomic Panel (GSOEP), is rich in covariate information.

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.

The GSOEP gathers annual information on demographic, labor market, and other variables since 1984. The data cover the German population and an oversample of

guestworkers⁶ and other immigrants. In our analysis we pool information on all individuals observed between 1984 and 1998 and consider those born between 1960 and 1979.

3.2 Definition of Subsamples

We are interested in testing, first, whether there are diverging trends in the educational attainment of nationals and second generation immigrants and, second, in investigating whether the assumption in the literature that first and second generation immigrants can be pooled in one group (e.g. Gang and Zimmermann 2000) is appropriate. To answer these questions we define three subsamples: first and second generation immigrants and non-immigrants which we label nationals.

Given the limitations of our data which e.g. in the case of the *Mikrozensus* do not provide the place of birth of German nationals we define the three groups as follows: Individuals of German nationality are labeled "nationals." Second generation immigrants are characterized by birth in Germany and a foreign nationality, and first generation immigrants are foreign born and of foreign nationality. Unfortunately, information on the parental place of birth is not available.⁷ We consider individuals, who were born between 1960, when we observe the first sizeable second generation immigrant cohort, and 1974, when the last were born who could possibly finish secondary education by 1995, the date of the *Mikrozensus* survey.

In the GSOEP we define the two immigrant groups as before: first generation immigrants are of non-German nationality and born abroad, second generation immigrants are

⁶ 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.

⁷ 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 of foreigners did not provide this information and were therefore 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. Problems relating to non-random naturalization of immigrants are discussed below.

those who are non-German but born in Germany.⁸ Because the GSOEP data provides the place of birth for all individuals we can refine the definition of nationals and separate the foreign-born from the German-born nationals. Because a large share of the foreign-born nationals does not provide informative data we omit this entire group in subsequent GSOEP analyses.

3.3 The Naturalization Issue

If the decision to take up German citizenship is correlated with educational attainment, any divergence in educational attainment between nationals and 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 2 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.⁹ Regrettably there is no information available on the education of individuals taking up German nationality.

Figure 2 shows that through 1994 no more than one percent of the immigrants from the countries most relevant for our analysis obtained German citizenship in any given year.¹⁰ Since most of these naturalizations concerned individuals beyond the age groups that we are

⁸ As before these categories only approximate second generation immigrant status, where some of those coded second generation may already be third generation immigrants and some of those coded nationals may be naturalized children of first generation immigrants. This is discussed below.

⁹ 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.

¹⁰ See Table 2(a) for the *Mikrozensus* nationality composition and footnote 16 for the GSOEP data.

interested in and possibly immigrants of the first generation - while we focus on the second generation only - we can safely assume that our analyses through 1994 are unaffected by naturalizations.

4. Empirical Evidence

4.1 *Mikrozensus* Data: Descriptive Statistics and Estimation Results

Descriptive Statistics: Figure 3a describes the population shares of first and second generation immigrants as of 1995. Overall 9.1 percent of the population were foreign citizens, with a maximum of 18 percent among the 23 year olds (Figure 3b). As of 1995 second generation immigrants alone accounted for about half of the foreign population below age 20 and made up over 10 percent of the entire population among infants. Large immigration in recent years (cf. Figure 3c) suggests that the population share of second generation immigrants is to rise even further in the future.

Table 1 provides evidence on the distribution of nationals, first, and second generation immigrants across different schooling degrees.¹¹ The educational attainment of the three population groups differs substantially. First, immigrants have a much higher risk of not completing a degree than nationals. Among the completed degrees the basic *Hauptschul*-degree is particularly frequent for these groups. Second, medium level degrees are more frequent among nationals than among immigrants. Finally, nationals 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 are more likely to receive higher degrees.

Table 1b lists the educational attainment of immigrants who are born abroad by age at

¹¹ 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.

migration. In contrast to our approach 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 1b shows that the earlier the child entered the German educational system, the higher the attained degree (see also Chiswick and DeBurman 2003). This sensitivity of schooling degrees to age at migration suggests that pooling first and second generation immigrants combines groups which are different in nature.

To evaluate the trends in school attainment across cohorts Figure 4 presents the cohort shares of nationals and second generation youth, who obtained no or a basic schooling degree and the highest (*Abitur*) degree. The graphs confirm the educational improvement among nationals, 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 nationals' trend.

Multivariate Analysis: The objective of the multivariate analysis is to provide a more formal test of differential trends in the school attainment of Germans and second generation immigrants. Our sample consists of only these two groups.

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*.

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 second generation immigrants experienced slower improvements in their educational attainment over

time than nationals. 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 Veenman 2003), however, this measure is not available in the *Mikrozensus*.

The regression is estimated for 105,196 observations using an ordered probit model.¹² The results are presented in Table 2. 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 nationals. This effect is robust to the consideration of additional explanatory variables in model (2), which thus do not explain the development. In columns (3) and (4) 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 nationals and second generation immigrants.

When the estimates of columns (1) through (4) of Table 2 are used to predict the educational attainment of those born 1960 versus 1974, nationals' probability to graduate with

¹² The standard ordered probit model is applied, which considers identical cutoff parameters for all observations. This implies that by necessity both thresholds are shifted proportionally for any subpopulation controlled for in the model. Being a second generation immigrant cannot reduce, both, the probability of attaining high and low educational degrees. Since our interest focuses on changes in immigrant effects over time this restriction should not invalidate our results.

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 declined.¹³

The significant difference in the two samples' cohort effect disappears when country of origin indicators are considered in the model (see column 5).¹⁴ This suggests that the nationality composition of immigrants is a main determinant of diverging trends in educational attainment. Table 3 describes the educational attainments by ethnic group (Panel A) and the change in the ethnic composition of second generation immigrants over time (Panel B). We find substantial differences in educational attainment by country of origin: while youth of Greek and "other" origin obtained comparatively high educational degrees the educational success of immigrants of Turkish and Italian origin remained far below average. Panel B describes shifts in the country-of-origin composition among second generation immigrants over time: the share of Turkish youth almost doubled over time whereas the share of youth of "other" countries of origin vastly declined. These changes in the nationality composition of immigrants clearly affect aggregate measures of educational attainment.¹⁵

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

¹³ 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.

¹⁴ The indicators distinguish former Yugoslavian, Greek, Italian, and "other" nationalities, with Turks as the reference group. The coefficients are individually and jointly statistically significant.

¹⁵ Interestingly, separate estimations with country-specific cohort effects (not presented to save space) yield that youth of Turkish origin ("other" origins) improved their educational attainment significantly faster (slower) than nationals. Trends in certain origin-specific attainment may differ from that of all second generation immigrants as a group, because the latter represents the population-share weighted average of all origin-specific trends.

possibly came to Germany exactly in order to receive training and qualified labor market experience.

Models estimated separately for males and females corroborate that second generation immigrants' educational attainment lags behind that of nationals, an effect which disappears only when country of origin controls are considered. Thus the multivariate analysis confirms the differential development of school achievement for nationals and second generation immigrants.

4.2 Analysis of GSOEP Data

4.2.1 Descriptive Statistics and Empirical Approach

Table 4 describes the distribution of German-born nationals, first- and second generation immigrants by schooling degree based on the GSOEP sample. As in the *Mikrozensus* data in Table 1, nationals have the highest share of individuals with advanced degrees followed by second generation immigrants, and the smallest share among those with low educational attainment. The overall patterns in educational attainment for second generation immigrants are similar across the two datasets.

As a first step our empirical strategy repeats the analysis that was performed above using *Mikrozensus* data. Also with the GSOEP data, the dependent variable considers three categories of educational attainment, which we observe for a sample of 6,189 nationals and 595 second generation immigrants, born between 1960 and 1979.¹⁶

We then extend the *Mikrozensus* analysis by controlling for the impact of a far richer set of covariates. Following the literature, we investigate the impact of birth cohort, and demographics, such as sex, health and whether the individual has completed secondary

¹⁶ 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 national and 4.9 percent of the immigrant observations were dropped.

education at the time of the survey. 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, finally, 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 for whom "years since parents' migration" is missing, the variable is coded zero and a "missing value" indicator is added to the specification.

Given its relevance in theoretical models we consider detailed controls for parental human capital. We 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 control for a missing value indicator.

4.2.2 Estimation Results

Trends: Column 1 in Table 5 presents ordered probit estimation results paralleling specification (1) in Table 2. The estimates of the immigrant cohort effects are not individually significant, but the coefficients describing second generation immigrants are jointly significant at the one percent level.¹⁷ Comparable to the *Mikrozensus* results, predictions based on model (1) in Table 5 yield a falling risk of low degrees and an increasing probability of attaining advanced degrees for nationals of subsequent birth cohorts. The opposite development is found for second generation immigrants.¹⁸ The significant difference in developments over the subsamples' subsequent cohorts holds up to the controls in model (2) and disappears, just as with the *Mikrozensus* data, when country of origin indicators are considered.

¹⁷ 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.

¹⁸ These predictions are probably not statistically significant and serve to merely illustrate the implications of the estimates.

Second Generation Results: Some of the results in Table 5 confirm for second generation immigrants what has been known before for combined first and second generation immigrant samples. Similar to Büchel and Wagner (1996), column 2 yields significantly lower schooling for men than for women. The effect is (insignificantly) larger among immigrants than among nationals.¹⁹ Poor health reduces the educational success of nationals, 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 first and second generation immigrants. 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.²⁰ The jointly significant "years since household migration" effect suggests that early parental migration is positively correlated with educational success. The highest educational attainment is reached if birth occurs over 20 years after parental migration.

Given its importance in child investment models, the significance of parental human capital, which could not be controlled for with *Mikrozensus* data, is not surprising. The main effects of parental degrees are highly significant and positive. 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, the effects for second generation immigrants are

¹⁹ Tests on gender differences for given nationalities yielded no statistically significant effects.

²⁰ Controlling for language indicators is standard in the literature on the educational attainment of immigrants (cf. Alba et al. 1994, Büchel et al. 1996, Sweetman and Dicks 1999). If the indicators were endogenous to the attained degree we 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. Therefore we presume that this potential endogeneity does not affect our results.

always smaller than those for nationals.²¹ This corroborates the finding of GZ, who conclude that the first generation's human capital is depreciated upon migration.

The findings on ethnicity effects differ somewhat from those presented by GZ, possibly because GZ considered only immigrants from a selection of five countries of origin. With our data 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: We have argued throughout that it is important to separate first and second generation immigrants in the analysis. Table 4 showed sizeable differences in these groups' attainment. Also, more than 30 percent of first generation immigrants had schooling degrees classified as *other*. This renders the definition of a meaningful dependent variable difficult for this subsample and may induce biases in studies which mix immigrants from both generations. To test whether the measurable covariate effects differ for these two groups, we reestimated our model adding first generation immigrants with information on schooling degrees to the sample. Interaction terms are considered which indicate whether there are significant differences between the two subsamples: The immigrant indicator (see Table 6) is coded for both generations, whereas the second generation indicator shows the difference in coefficients for the second compared to the first generation.

There are significantly different effects of sex and German writing ability for first and second generation immigrants (see Table 6). Also, the joint effect of German language ability

²¹ The parental human capital interactions are jointly highly significant for both, columns 3 and 4.

(speaking and writing) is significantly different for the two groups. Taking on German nationality has a significant effect only for first generation immigrants (cf. Table 5). The effect of parental vocational training on educational attainment is similar for nationals and first generation immigrants, but jointly significantly different for second generation immigrants. Thus, there are clear differences in the determinants of educational attainment for the two groups of immigrants.

5. Conclusions

This study analyses the educational attainment of second generation immigrants in Germany. The focus is on the relative development of nationals' and immigrants' schooling success over time, as well as on the importance of separating first and second generation immigrants in this literature.

Three data sources are used. German aggregate statistics do not permit the analysis of immigrants by place of birth, i.e. a distinction between first and second generation immigrants. However, aggregate trends indicate that foreign youth did not partake equally in recent improvements in nationals' educational advancements. This conclusion is supported by data from the *Mikrozensus*, a representative one percent sample of German households with evidence for first and second generation immigrants, separately. For the latter we find significantly slower educational advancement compared to nationals. The finding is confirmed in multivariate analyses, and only disappears when controls for immigrant nationalities are considered. This suggests that the slower improvement in educational outcomes observed for second generation immigrants may be due to changing ethnic composition of this group over time. The analyses using the German Socioeconomic Panel corroborate these as well as main findings of the literature on educational attainment. We emphasize that there are significant differences in the determinants of educational attainment for first and second generation

immigrants which were overlooked in prior studies.

Finally, three aspects seem important: First, in times of high unemployment immigrants are more affected by job loss than nationals. The related decline in disposable incomes may have caused increasingly binding liquidity constraints which reduce parents' funds investible for education.²² 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, possibly rendering education less attractive over time. Third, *expected* returns to education - and with them incentives to invest in education - may have fallen with rising youth unemployment among immigrants (Riphahn 2002).²³

Independent of the mechanisms driving recent developments, educational attainment is of paramount importance for youth labor market opportunities (OECD 2000). This concerns not only second generation immigrant youth directly, which 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 - similar to the US sociological literature (cf. Portes 1996, Portes and Rumbaut 1996) - question the assumption that eventually children of nationals and immigrants will end up being indistinguishable.

²² 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 1998).

²³ Official statistics provide scarce information on this point: whereas in 1975 the share of unemployed youth in all unemployed was higher among nationals than among immigrants, this has been reversed ever since.

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

(a) Three Population Groups

Subsample	----- Low -----		----- Middle -----			High	N obs.
	None	Basic	Medium	Polyt.	FHR	Advanced	
National	5.50	27.61	24.74	13.56	4.79	23.80	104,001
Second Generation	11.72	46.19	20.50	2.50	2.43	18.91	1,195
First Generation	19.20	46.47	13.45	3.40	2.60	17.93	7,998

(b) First Generation Immigrants by Age of Migration

Age at Migration	None	Basic	Medium	Polyt.	FHR	Advanced	N obs.
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	1,594
16 - 35	20.42	41.07	12.69	0.48	2.88	22.46	5,445

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

Table 2 Estimation Results: Ordered Probit on Educational Degree Attained (MZ)

	Mean (Std.Dev.)	1	2	3	4	5
Second Generation (0/1)	0.011 (0.106)	1.282 * (.627)	1.415 * (.631)	-1.748 (10.904)	-.678 ** (.052)	-
Birthcohort	6.642 (0.415)	.215 ** (.008)	.226 ** (.008)	1.820 ** (.289)	-	.226 ** (.008)
Birthcohort * Second Gen.	0.079 (0.742)	-.263 ** (.089)	-.286 ** (.090)	.609 (3.203)	-	.071 (.101)
Birthcohort ^ 2	44.292 (5.542)	-	-	-.119 ** (.022)	-	-
Birthcohort ^ 2 * Second Gen.	0.558 (5.230)	-	-	-.063 (.235)	-	-
Born 1960 - 62 (0/1)	0.221 (0.415)	-	-	-	-.251 ** (.012)	-
Born 1963 - 65 (0/1)	0.229 (0.420)	-	-	-	-.169 ** (.012)	-
Born 1966 - 68 (0/1)	0.216 (0.412)	-	-	-	-.088 ** (.012)	-
Born 1969 - 71 (0/1)	0.186 (0.389)	-	-	-	-.009 (.012)	-
Born 1960 - 62 * Second Gen.	0.0007 (0.027)	-	-	-	.316 * (.147)	-
Born 1963 - 65 * Second Gen.	0.001 (0.033)	-	-	-	.351 ** (.122)	-
Born 1966 - 68 * Second Gen.	0.002 (0.041)	-	-	-	.031 (.105)	-
Born 1969 - 71 * Second Gen.	0.003 (0.052)	-	-	-	.193 * (.086)	-
Demographic Effects						
Female (0/1)	0.494 (0.500)	-	.085 ** (.007)	.085 ** (.007)	.085 ** (.007)	.085 ** (.007)
Living in East Germany	0.174 (0.379)	-	.366 ** (.009)	.367 ** (.009)	.367 ** (.009)	.366 ** (.009)
Living in Small City	0.425 (0.494)	-	-.306 ** (.008)	-.305 ** (.008)	-.305 ** (.008)	-.306 ** (.008)
Living in Large City	0.150 (0.357)	-	.270 ** (.011)	.269 ** (.011)	.269 ** (.011)	.270 ** (.011)
Assimilation Effects						
Partner in Home Country	0.00012 (0.011)	-	-.709 □ (.383)	-.711 □ (.384)	-.724 □ (.386)	-.415 (.395)
Parent in Home Country	0.00026 (0.016)	-	-.386 (.247)	-.390 (.247)	-.382 (.248)	-.622 * (.258)
Children in Home Country	0.000029 (0.005)	-	1.241 □ (.724)	1.225 □ (.725)	1.141 (.727)	1.296 □ (.713)
Country of Origin Controls						
	-	No	No	No	No	Yes **
μ_1	-	.993 (.056)	1.069 (.056)	6.370 (.962)	-.545 (.011)	1.069 (.056)
μ_2	-	2.142 (.056)	2.249 (.057)	7.551 (.962)	.635 (.011)	2.250 (.057)
Log Likelihood	-	-112 209.1	-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.

Standard errors are provided in parentheses.

2. Birth cohort interaction terms in specification 4 are jointly significant at the 5 percent level.
3. All estimations are based on 105,196 observations.

Table 3 Trends in Educational Attainments of Second Generation Immigrants by Nationality (in percent)

	Turks	Former Yugoslavian	Italian	Greek	Other	All
A. Educational Attainment						
Low	72.8	49.7	65.3	46.5	36.5	57.9
Middle	18.2	30.7	23.3	21.5	29.1	23.2
High	9.0	19.6	13.3	31.9	34.4	18.9
B. Share in All Second Generation Immigrants by Birth Year						
1960-62	22.7	6.7	18.7	6.7	45.3	100.0
1963-65	26.6	2.7	15.0	11.5	44.3	100.0
1966-68	23.1	5.2	27.8	22.0	22.0	100.0
1969-71	40.4	12.2	16.7	13.9	16.7	100.0

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

Table 4 Schooling Degree by Nationality / Country of Birth (in percent)

Subsample	----- Low -----		Middle	High	-- Other / Missing --		
	Obs.	None	Basic School	Medium	Advanced	Other	Missing
National	6,352	7.7	25.6	42.3	21.9	1.3	1.3
Second Gen.	626	17.6	39.8	22.4	15.3	3.5	1.4
First Gen.	1,451	19.0	36.5	7.0	5.4	30.1	2.2
All	8,429	10.4	28.5	34.8	18.6	6.4	1.5

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

Note: Percentage shares sum to 100 percent across each row.

The group labelled "national" comprises only German-born individuals of German citizenship.

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

	Descrip. Statistics	1	2	3	4
Cohort Effects					
Second Generation (0/1)	.087 (.283)	-12.87 (12.44)	-26.66* (13.08)	-20.54 (13.71)	-22.43 □ (13.85)
Birthcohort (i.e. calendar year - 1900) / 10	6.818 (.536)	1.494* (.684)	.560 (.711)	.571 (.713)	.571 (.713)
Birthcohort Squared / 100	46.776 (7.405)	-.118* (.050)	-.057 (.052)	-.059 (.052)	-.059 (.052)
Birthcohort * Second Generation	.631 (2.039)	3.522 (3.509)	7.405* (3.687)	5.760 (3.866)	6.241 (3.901)
Birthcohort Squared / 100 * Second Gen.	4.556 (14.807)	-.249 (.247)	-.517* (.259)	-.401 (.272)	-.443 (.274)
Demographic Effects					
Male (0/1)	.492 (.500)	-	-.109** (.028)	-.098** (.029)	-.098** (.029)
Male * Second Generation (0/1)	.045 (.207)	-	-	-.144 (.104)	-.136 (.105)
Disabled (0/1)	.054 (.227)	-	-.230** (.063)	-.261** (.066)	-.261** (.066)
Disabled * Second Generation (0/1)	.006 (.080)	-	-	.320 (.204)	0.342 □
Still in school (0/1)	.017 (.128)	-	-.784** (.128)	-.790** (.135)	-.790** (.135)
Still in school * Second Gen. (0/1)	.002 (.047)	-	-	.072 (.420)	.056 (.420)
Assimilation Effects					
Obtains German passport	.003 (.051)	-	-.078 (.289)	.110 (.296)	.112 (.298)
Speaks German well (0/1)	.973 (.161)	-	.474** (.168)	.487** (.169)	.529** (.171)
Writes German well (0/1)	.966 (.180)	-	-.004 (.155)	.025 (.156)	-.037 (.157)
Years since hh. migrated ³	0.501 (1.999)	-	.065 (.041)	.061 (.040)	.058 (.040)
Years since hh. migrated ^2	4.245 (22.956)	-	-.002 (.003)	-.002 (.002)	-.001 (.002)
Years since hh. mig. missg.	.008 (.089)	-	-.051 (.229)	-.103 (.230)	-.077 (.234)

Parental Human Capital

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

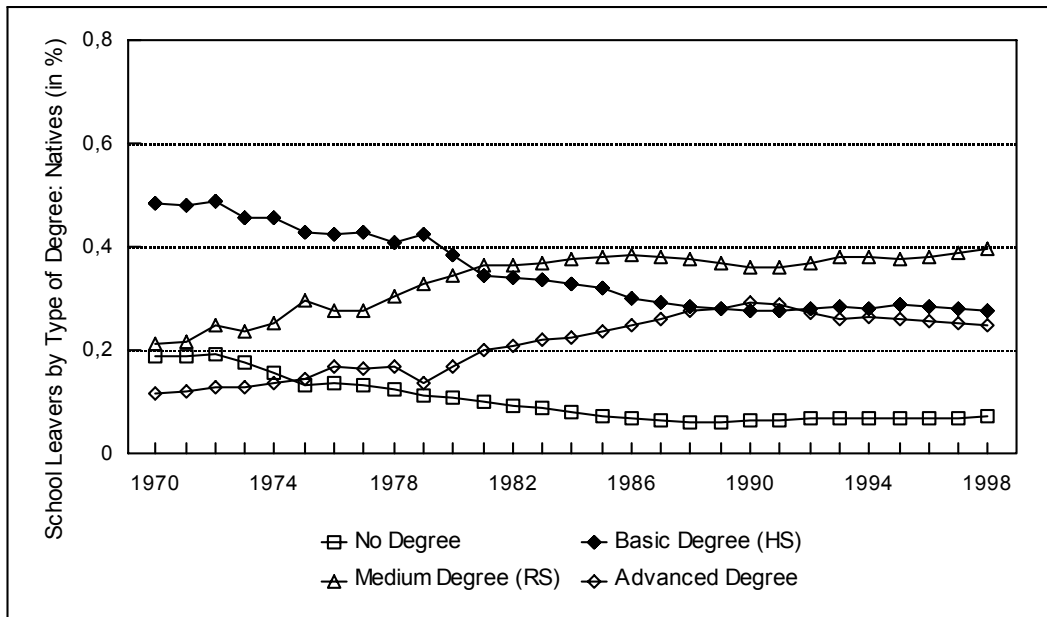
	Coeff.	St. Error
Cohort Effects		
Immigrant (0/1)	-11.391	11.889
Second Generation (0/1)	-8.550	17.811
Birthcohort (i.e. (calendar year - 1900) / 10)	0.057	0.071
Birthcohort Squared	-0.058	0.052
Birthcohort * Immigrant	0.292	0.348
Birthcohort Squared / 100 * Immigrant	-0.187	0.253
Birthcohort * Second 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) ⁵	0.352	0.232
Writes German well * Sec. Generation (0/1) ⁵	-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) ⁶	0.063	0.169
Mother has at least basic sch. deg. * Sec.Generation (0/1) ⁶	-0.251	0.169
Father has vocational degree * Sec. Generation (0/1) ⁶	0.102	0.157
Mother has vocational degree * Sec. Generation (0/1) ⁶	-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	

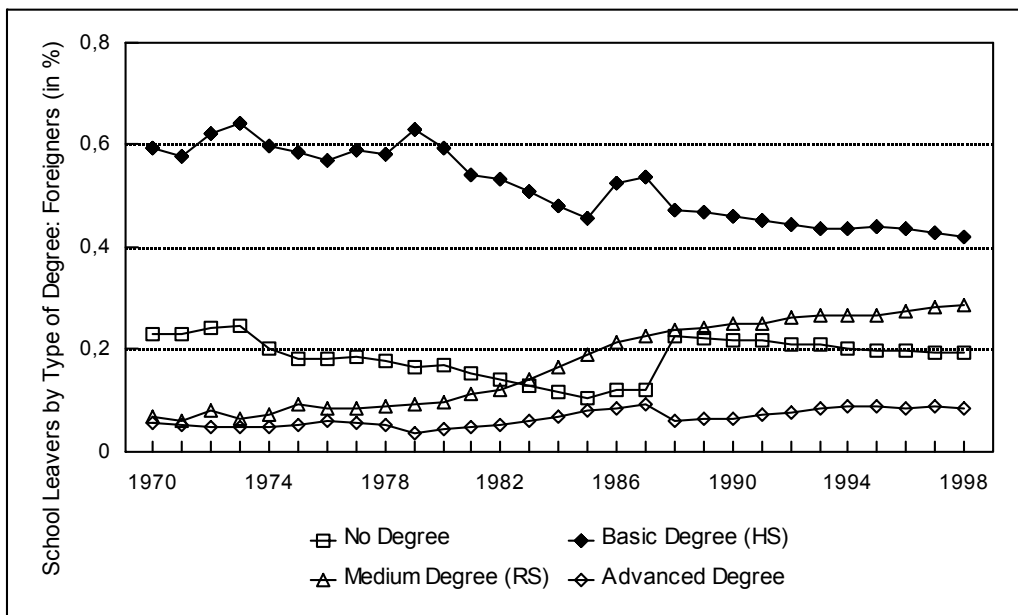
Note:

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 nationals.
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.
5. The interaction terms are jointly significant at the 5 percent level.
6. The interaction terms are jointly significant at the 10 percent level.

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



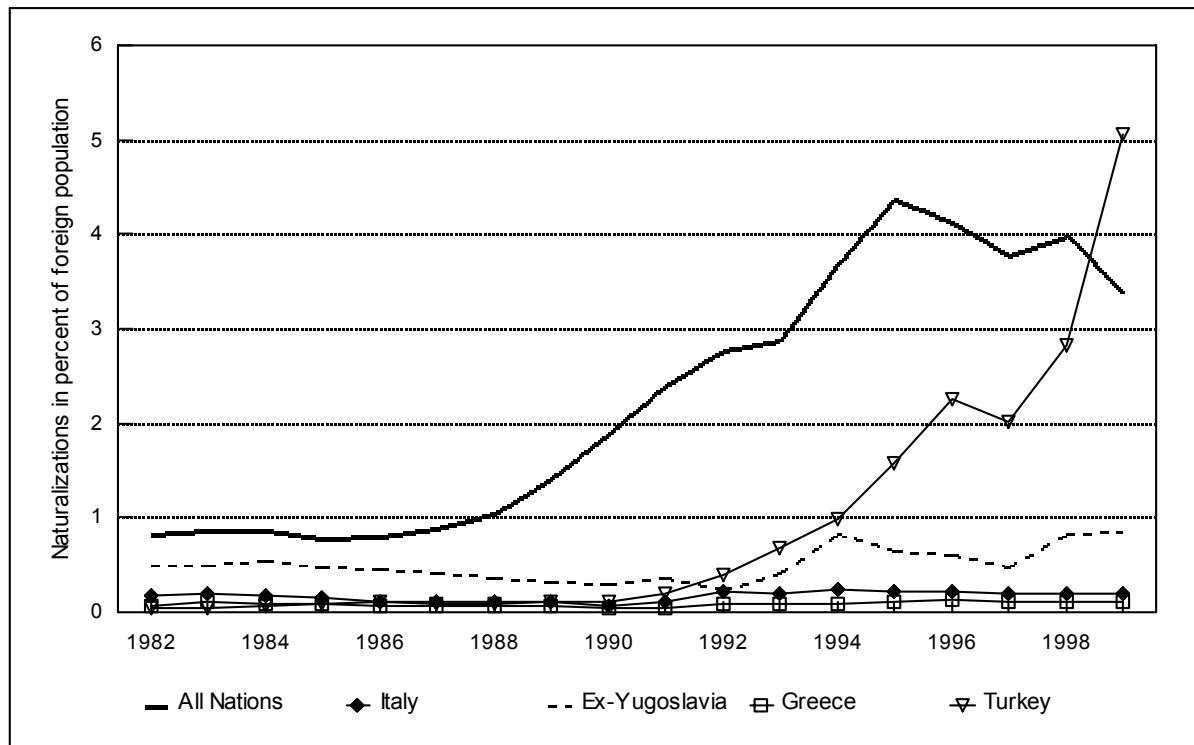
(b) Foreigners



Note: The nationality split between national 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.

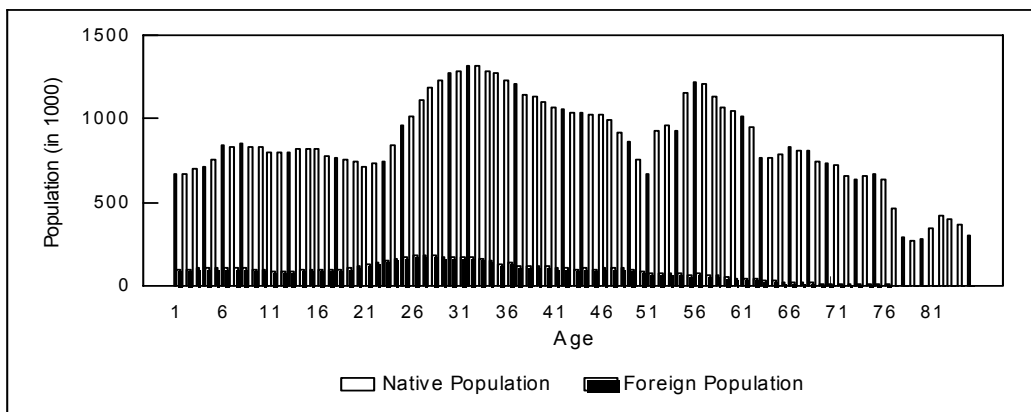
Source: Own calculations based on figures taken from Statistisches Bundesamt, Fachserie 11, Reihe 1, various years.

Figure 2 Trends in Naturalization over Time

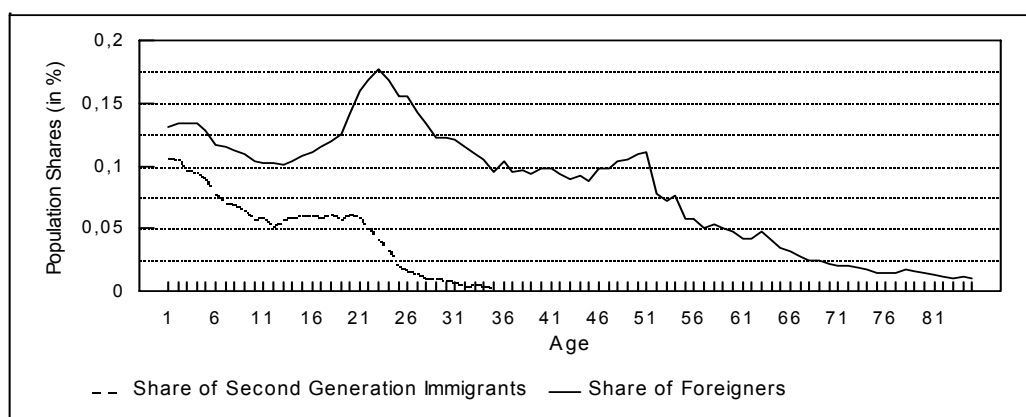


Source: Own calculations based on data taken from Statistical Yearbooks (various years). Data on the naturalization of Greek nationals is obtained directly from the federal statistical office.

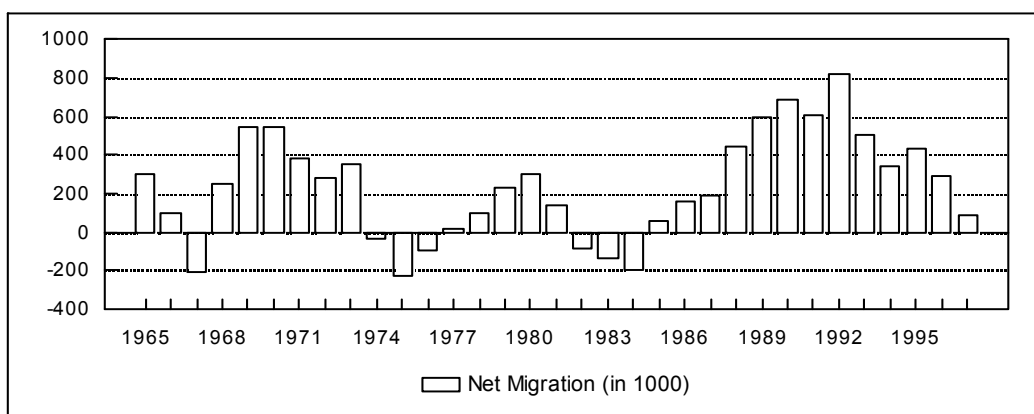
Figure 3 Number and Population Share of Immigrants as of 1995
 (a) Absolute Number



(b) Population Share



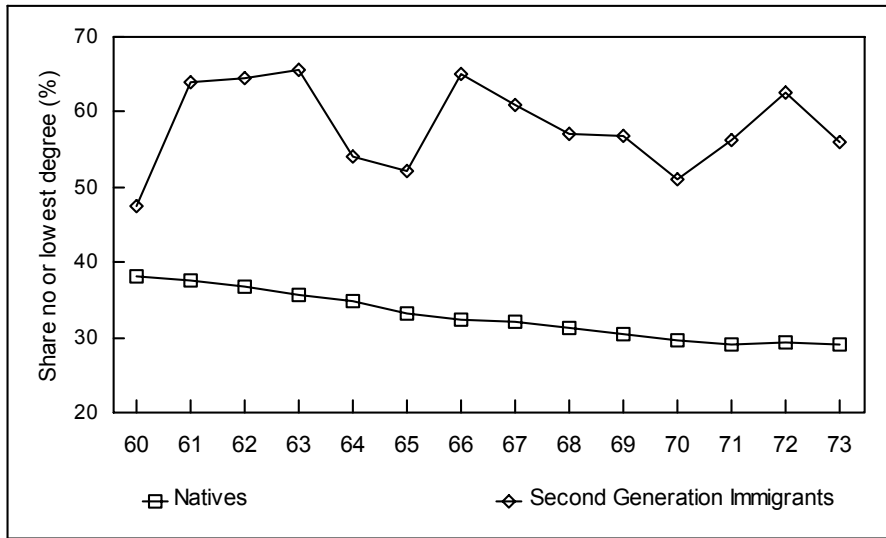
(c) Net Migration



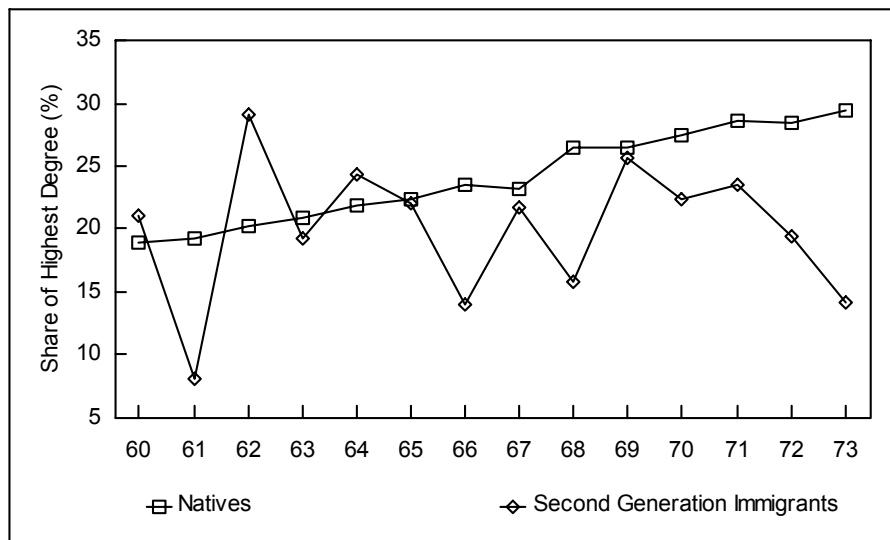
Note: The population of Germans might contain immigrants who took on German nationality.
 Source: Information on age-specific population by age and nationality as of Dec. 31, 1995 by fax from German Federal Statistical Office. Population share of second generation immigrants calculated based on share 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 4 Cohort Shares

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



(b) Advanced School (*Abitur*) Degree



Source: Own calculations based on *Mikrozensus* 1995.