

Does Citizenship Matter? The Economic Impact of Naturalizations in Germany

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The paper analyses whether citizenship acquisition affects the labour market performance of immigrants in Germany. The study uses actual micro data from the employment sample of the Institute for Employment Research, which covers more than 80% of the entire labour force in Germany. The econometric analysis has been carried out using panel data techniques, which allow to disentangle the effects of self-selection and legal impact of citizenship acquisition. The estimates from a pooled OLS specification suggest the existence of a wage premium for naturalized immigrants. Panel estimates show an immediate positive naturalization effect on wages and an accelerated wage growth in the years following the naturalization event. Both results are consistent with the argument that naturalization increases the labour market opportunities of immigrants in various ways.

Keywords: citizenship, naturalization, self-selection, economic impact, integration.

JEL Classification: J31, J61, J68

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1 Introduction

The analysis of citizenship has had a long tradition within the moral and political theory. The socio-political importance of citizenship in the civic society has been emphasized amongst others by John Locke (1690), who distinguishes between active and passive membership in a society. He argues that only the access to citizenship by explicit commitment and contract makes an individual a full member of a nation state. This position has by now been embraced by almost all legal systems of modern states, which differentiate their inhabitants into natives and foreigners. Although the process of acquiring citizenship differs between the various countries, citizenship in all states is connected with a number of legal rights. An example is the entitlement to vote, which is typically associated with citizenship in modern societies. Consequently, naturalization, which is defined as the acquisition of citizenship of a country by a foreigner, can affect the socio-economic integration of immigrants in a country in various ways.

Whereas social scientists have spent significant efforts to analyse the political and sociological implications of naturalizations, economists have neglected this topic a long time.¹ One of the first economic studies that deal with the issue of citizenship is by Chiswick (1978), who has analysed the economic assimilation of immigrants. Using cross-Sectional data from the U.S. census for the year 1970, Chiswick examines the assimilation process of immigrants by comparing the earnings of native and foreign-born men. Overall, Chiswick finds a positive effect of naturalization on earnings, which becomes insignificant when he controls for years of residence. In the following years, the economic literature on immigrant assimilation has mainly focused on skill and language acquisition. Recently, economists have renewed their interest in the topic of naturalizations. However, most of them have considered this issue in only the U.S. or Canada (see Bratsberg et al. 2002, DeVoretz and Pivnenko 2005, DeVoretz 2008, Mazzolari 2009). For European countries, only a few empirical studies that analyse the economic impact of naturalizations exist, such as that by Kogan (2003) for Austria and Sweden, Bevelander and Veenman (2008) for the Netherlands and Scott (2008) for Sweden.

A drawback of most existing studies on the impact of naturalization is that they are based on cross-Sectional data, which does not allow to control for self-selection concerning unobservable characteristics within the group of immigrants. The study of Bratsberg et al. (2002) is the first to use cross-Sectional as well as longitudinal data to estimate the effect of

¹ For a comprehensive overview of sociological studies about naturalizations, see Yang (1994).

naturalization on wage growth of foreign-born men. The authors show that naturalization has a significant positive effect on the earnings of immigrants even after controlling for differences in unobserved individual characteristics. Bratsberg et al. (2002) demonstrate that wage growth accelerates after the acquisition of citizenship, indicating the existence of barriers to entry in certain jobs for immigrants without U.S. citizenship. In his longitudinal analysis for Sweden, Scott (2008) finds mixed results about the effect of naturalization on wages of immigrants. In contrast to the findings of Bratsberg et al. (2002), he concludes that the true naturalization premium of immigrants is largely caused by selection on the part of the individual and not by legal implications. Overall, the empirical evidence from longitudinal studies is scarce. In addition, the seminal work of Bratsberg et al. (2002) is based on small sample size and therefore does not allow to analyse the impact of naturalization by country of origin.

For the case of Germany, there is, until the present, no empirical evidence on whether the acquisition of citizenship has any effects on the labour market outcomes for immigrants. Furthermore, the role of unobserved characteristics in explaining the naturalized immigrants' wage premium remains unclear. The purpose of this paper is to address this question by estimating the impact of naturalization on wage growth of immigrants in Germany. The data used are actual register data obtained from the employment sample of the Institute for Employment Research (IAB) covering more than 80% of the entire labour force in Germany. The econometric analysis is carried out using panel data techniques, which enable to disentangle the effects of self-selection and the legal impact of citizenship acquisition. Furthermore, the large sample size allows us to identify the impact of citizenship acquisition across different groups of immigrants.

The paper is organized as follows: Section 2 presents stylized facts on naturalization in Germany by outlining the legal framework and the quantitative dimension of the phenomenon. Section 3 contains some theoretical considerations about the relationship between legal status and labour market performance. The data set and selected descriptive statistics are presented in Section 4. Section 5 contains the results of the pooled and longitudinal estimations. In Section 6 we carry out a series of robustness checks. Section 7 concludes the paper, discussing the policy implications of the analysis.

2 Naturalizations in Germany

2.1 Citizenship Law

Until the beginning of the 1990s, the German citizenship law was characterized by the principle of *Jus Sanguinis*, i.e. the principle of descent. According to this, citizenship is recognized for any individual born to a parent who is a national or citizen of Germany. Furthermore, foreigners had no entitlement to naturalization derived from law. Neither birth nor prolonged residence in Germany established any right to avail German citizenship. However, foreigners were able to acquire citizenship via discretionary decisions. This refers to situations in which citizenship is granted by public authorities without any subjective entitlement of the applicant. The difference to naturalizations based on entitlement is that citizenship acquisition may be denied even if the applicant fulfils all conditions specified in the law. Amongst these conditions were a minimum residence of 10 years, a sufficient income and the renouncement of previous citizenship. In addition to this, the law contained a provision which alleviates citizenship access for foreign spouses of Germans (see Brubaker 1992, pp. 77-84).

With the beginning of the 1990s the legal provisions regarding naturalizations were liberalized for young immigrants (older than 18, younger than 23). Similar changes were implemented for immigrants who lived at least for 15 years in Germany (see Brubaker 1992, p. 78). The legal situation in Germany changed substantially in 1999, when a fundamental reform of the citizenship law was conducted. The reform added the principle of *Jus Soli* to the existing law. Thanks to this reform, children of immigrants attain the German passport by birth if they are born in Germany. A special provision allows them to retain the citizenship of their parents until the age of 23. Before attaining this age, they have to decide between one of the two citizenships. This solution has been called the “option model”. Furthermore, the new law entitles every immigrant to naturalization if she/he fulfils a number of requirements. These requirements are: residence of at least 8 years in Germany, possession of an appropriate residence permit, sufficient knowledge of the German language, the ability to support themselves without recourse to social assistance or unemployment benefits, allegiance to German constitution and no serious criminal offences. Finally, they must also relinquish their previous citizenship.² During the preceding years, this has been the most frequently used channel by which immigrants naturalized in Germany (see Steinhardt 2007, pp. 544-545).

² For this requirement, there exist a set of exceptions.

Recently, Germany has implemented a standardized naturalization test, which is obligatory since September 2008 for all immigrants who desire to naturalize. The multiple choice test includes various questions on German history, geography, politics and society.

2.2 Quantitative Dimension

Figure 1 shows the number of annual naturalizations in Germany during the period from 1975 to 2008. As it is clear from the figure, naturalizations played a minor role during the 1980s, with less than 50,000 naturalizations per year. From the beginning of the 1990s, the picture changes and the number of naturalizations increased continuously, with a peak in 1995, when 313,000 people acquired German citizenship. However, the overall figures include ethnic Germans, the so-called Spätaussiedler. These are immigrants of German origin from the former Soviet Union (see Steinhardt 2007, pp. 545-546). This group is not of interest for this analysis, because in general they automatically receive the German citizenship without any precondition when they enter the country. Therefore, the diagram separately shows for the period 1994 to 2008 the number of foreigners (immigrants of non-German origin) who naturalized.³ With the new citizenship law coming into effect on the 1st of January 2000, the number of naturalized foreigners increased strongly. Although the number of naturalizations declined almost continuously in the subsequent years, it is remarkable that between 2000 and 2008, on average, 120,000 foreigners decided to become German citizens per year, compared to 92,000 per year during the period 1994 and 1999. Overall, almost 1,800,000 foreigners naturalized during the period 1994 and 2008.

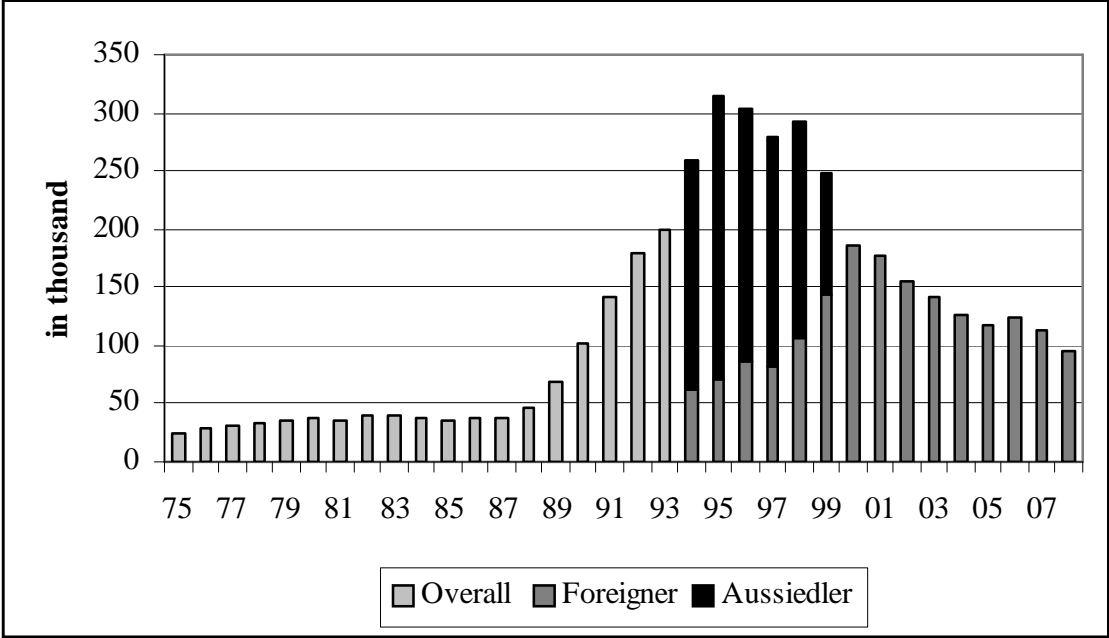
To interpret these figures, it is useful to incorporate the size of the foreign population within the country. This is accomplished by calculating the naturalization rate, which is annually defined as the number of naturalizations in relation to the number of foreigners within the country. It now becomes obvious that the share of immigrants in Germany who naturalize is relatively low compared to other European countries. While in 2006, the naturalization rate in Germany was 1.7%, countries such as France (4.2%), the Netherlands (4.2%), Great Britain (4.5%), Austria (3.2%) and Sweden (10.7%) had significantly higher naturalization rates.⁴ This might be due to the national differences in legal frameworks, the socio-economic

³ The numbers of naturalized foreigners have been constructed by the author. Due to time inconsistencies related to immigration and naturalization of ethnic Germans, the depicted figures can contain some inaccuracies. The figures before 1994 were not reconstructible due to legal reasons. With beginning of August 1999 ethnic Germans were not any more included in the naturalization statistics of the Federal Statistical Office.

⁴ Figures derived from own calculations with data obtained from Eurostat. We follow the official definition of naturalization rates from the Federal Statistical Office of Germany which includes the whole foreign population in the denominator irrespective whether they fulfill the criteria for naturalization.

structure of the immigrant populations, and eventually, the public opinion toward naturalization.⁵

Figure 1: Naturalizations in Germany 1975-2008



Source: own calculations with data from the Federal Statistical Office

Since the 1990s, the leading country of origin among naturalized foreigners in Germany has been Turkey. This observation is consistent with the fact that Turks are by far the largest group within the foreign population in Germany. In 2000, 44.4% of all naturalized immigrants were of Turkish origin. The second largest group within naturalized immigrants contains people of Asian origin (26.5%). The leading countries within this group are Iran, Afghanistan and Lebanon. The third major group consists of ex-Yugoslavs, who accounted for 9.7% of the naturalized immigrants in 2000. In contrast to this, the share of naturalized immigrants from an European Union (EU) country is with 4.3% comparatively low (see Steinhardt 2007, pp. 546-548). The aggregate figures therefore show that the topic of naturalization in Germany is mainly related to immigrants from outside the EU.

⁵ The topic of naturalization in German debates has been frequently connected to fears and concerns that might lower the incentive for foreigners to naturalize. A prominent example is the debate on naturalization tests in early 2008, which focused on the question: “How can we avoid the situation that immigrants with unfavorable characteristics will become German citizens?”

3 Legal Status and Labour Market Performance

In the following Section, some theoretical arguments are discussed to explain why naturalization could change the economic well-being of an immigrant. Because in many cases, the effect depends strongly on the legal requirements and consequences of naturalization within a country, the following discussion refers explicitly to the situation in Germany. In our analysis we distinguish between three groups of immigrants working and living in Germany: citizens of the EU or associated states, Turkish immigrants and so called Third Country Nationals (TCNs). Latter refers to foreigners with a nationality of a country which neither belongs to the European Union nor has any bilateral agreements with Germany regarding labour market access (e.g. Iran, Lebanon, and Egypt). The legal status and labour market access differ strongly among the three groups: immigrants belonging to the first group have in principle the same rights like German employees. Turkish immigrants enjoy privileged access to the German labour market, but the treatment still differs from EU immigrants in various ways. Third Country Nationals face strong legal restrictions for labour market access. In general, they are still subject to the recruitment ban, although several exceptions exist which allow them to take up employment in Germany under certain conditions (see Hailbronner 2007, pp. 8-12).

The first obvious channel by which naturalization can affect productivity is unrestricted access to the labour market (see Yang 1994, pp. 452-453; Bratsberg 2002, pp. 569-570). Due to legal reasons, access to a number of jobs in the public sector requires the possession of a German passport. For example, jobs in the justice, national defence, and administrative departments are generally reserved for German citizens.⁶ To some extent, this also holds true for certain jobs within the independent personal services, including practices such as dentists, doctors, pharmacists, lawyers and architects. However, these restrictions do not apply to European citizens.⁷ Furthermore, numerous jobs require unrestricted mobility of employees without any bureaucratic hurdles. This is especially related to jobs in the transport sector or cross-border services that are associated with a high frequency of travel. For this reason, the possession of the German passport is not a legal engagement criterion, but a functional precondition. Therefore, naturalization reduces institutional and functional labour market barriers and enables a free job choice of immigrants.

⁶ This regulation applies to EU citizens as well. The general possibility of EU citizens becoming civil servants can be restricted for strictly sovereign activities (see §39 section 4 Treaty establishing the European Community (TEC)).

⁷ I would like to thank Marcel Kau from the University of Konstanz, who helped to clarify the actual legal situation in Germany.

In addition to this, naturalization can lead to a reduction of costs from the perspective of the employer. In the case of foreign employees with a temporary work or residence permit, this cost reduction occurs in two modes. First, naturalization results in a decline in the administrative costs of the employer. This is caused by the fact that the administrative effort of the employer for foreign workers is in this case significantly higher than for workers with a German passport. For instance, an employer who wants to engage a foreigner from outside Europe has always to conduct a so-called priority test, which ensures that no national or European worker is available to do the job (see Hailbronner 2007, pp. 17-18).⁸ This issue has already been raised by the German Federal Government in its annual report in 2000, when it pointed out that some employers abstain from employing foreigners due to legal and bureaucratic hurdles. Second, naturalization reduces the transaction costs of the employer (see Cahuc and Zylberberg 2004). From the perspective of the employer, a German passport alleviates the insecurity about the individual and occupational future of the employees, because it guarantees that the employed immigrant has the right to live and work permanently in Germany. Both these arguments imply that an employer, who has a choice between two job applicants with equal qualifications and skills, prefers the one with the German passport.

In the literature about the effect of naturalization impacts, the first component of this cost reduction argument has already been addressed (see Bratsberg et al. 2002, p. 569; Mazzolari 2009, p. 180). In general, it is associated with the phenomenon of discrimination. However, following Becker's (1973 pp. 13-17) definition, this behaviour of the employer cannot be judged as discriminatory. The higher administrative costs of foreign employees are an objective reason to prefer employees with a German passport. Despite this, it has to be assumed that some employers have a taste for discrimination, which sums up to the market wage rate (see Becker 1973, pp. 39-40). However, in contrast to the United States, by law legally employed foreigners in Germany are treated equal to natives in the job. This is true for aspects of both employment provisions and trade union agreements (see Hailbronner 2007, p. 20). To sum up, naturalization can increase the labour market opportunities of an employee with migration background in several ways. Due the existing provisions regarding the free mobility of workers within the EU, the distinction is to a lesser extent about having a German or a foreign nationality, but about being an EU citizen or a TCN.

⁸ The test guarantees the so-called primacy of natives ("Inländerprimat"), which is part of the foreigner legislation in Germany since 1965.

Furthermore, naturalization provides job relevant information to the employer. With the decision to naturalize, the individual expresses his wish to live permanently in Germany, demonstrates sufficient language skills, proves that he has already lived for a number of years within the country, commits to the German constitution, and has been able to support himself without needing social assistance or unemployment benefits prior to naturalization. This information is, in general, positively reviewed by the employer since it documents a certain degree of identification and integration. Because an employer cannot observe the productivity of an employee, every transaction on the labour market is connected with an extent of uncertainty from the perspective of the employer before hiring. For this reason, an employer uses the observable characteristics of a job applicant to estimate the conditional probability of competence (see Spence 1974, pp. 5-9). These characteristics can be all the information about the individual to which the employer has access prior to hiring. In general, these are education, employment history and personal characteristics. Whereas some of these characteristics, e.g. education, are partially or completely controllable by the individual, others are not (e.g. gender). From the perspective of the employee, it is reasonable to make those adjustments that will improve his or her position in the job lottery (see Spence 1974, pp. 9-14). The citizenship status is a personal characteristic, which can be altered by an individual, and which conveys significant information potential if it is not determined by birth. The naturalization act therefore can be interpreted as a signalling device, which can be used by employers for selection purposes. In this way, naturalization may also help to reduce statistical discrimination. First evidence from a field experiment for France indicates that having French nationality improves the chances to get an invitation for a job interview (see Duguet et al. 2007).⁹

An aspect by which the productivity can increase directly is connected to the location decision of naturalized employees. In almost all cases, immigrants who naturalize have already decided in advance that they stay in Germany over a longer period or for lifetime. In general, this long-term location decision encourages immigrants to foster their investment in education, language, and country specific skills (see Mincer and Polachek 1974). The accumulation of human capital should have a positive impact on the labour market performance and should lead to assimilation in earnings to natives. The following empirical analysis will try to address these different impact channels by integrating the time dimension explicitly in the analysis. If naturalization has a positive impact on labour market

⁹ To the knowledge of the author no other field experiment on ethnic discrimination compares immigrants with and without citizenship.

opportunities, naturalized employees should exhibit some change in their labour market performance after the naturalization. If, on the other hand, the investment in country-specific human capital affects the productivity positively, naturalized employees should also feature stronger wage growth before the acquisition of German citizenship.

4 Data and descriptive statistics

The data is from the current version of the employment sample of the IAB, which is a 2 percent random sample of all employees in Germany covered by social security during the period 1975 to 2004. According to this restriction, the sample includes no self-employed persons, family workers and civil servants. Overall, the dataset covers more than 80% of the whole labour force in Germany. The sample contains various sociodemographic characteristics at the individual level, such as daily wage, education and age (see Bender and Haas 2002). In our analysis we focus on full-time employed men. We therefore exclude part-time employees, unemployed persons, trainees and persons with wages below the limit for social insurance contributions.¹⁰ The restriction to men becomes necessary because of the significant differences between men and women concerning their employment history.

The legal basis of the dataset is the integrated reporting procedure regarding pension, unemployment and health insurance. The data are therefore highly reliable in comparison to survey data.¹¹ However we have to consider, that the reliability differs between particular variables. Generally, it can be distinguished between characteristics that are collected for insurance purposes (e.g. wage, employment duration), and information that has only a statistical use (e.g. education). Characteristics of the first category are related to payments to the social security system. The corresponding declarations of the employer are checked by the social insurance companies, the pension fund and the employment agencies through various plausibility tests. In contrast to this, the reliability of the statistical characteristics related to the employee relies nearly completely on the accuracy of the employer. Imprecise data entry is enforced by the fact that the reporting person changes with every new job of an individual. In general, two types of errors are possible: wrong information is recorded or wrong information is transferred (see Drews 2006, pp. 4-6). This leads to some inconsistency in the

¹⁰ The wages of the latter group are initially recorded in 1999.

¹¹ The reporting procedure demands from every employer that he notifies all employees who are subject to social security contributions within a certain time limit to the social insurance carriers. The data collection is a multistage process beginning with the employer reporting the information to the insurance companies. Subsequently, the data is submitted to the pension funds, which in turn send selected variables to the employment agency. These data is then used to construct the employment sample (see Federal Statistical Office Germany 2006, p. 6).

data concerning all individual characteristics that are not related to payments.¹² As a consequence a number of employees in the database have more than once changed citizenship during the entire observation period.¹³ Due to our sample selection, respectively our focus on spells of full-time employees, we already reduce the number of inconsistent nationality records.

Furthermore, we implemented various procedures to erase implausible information concerning the nationality of employees. As a first step, the original specification of the nationality variable from the weakly anonymous version of the employment sample is imported. This reduces the number of missing values significantly, because the weakly anonymous version contains detailed information about the nationality of employees from the New Laender also. Second, we grouped individuals together which might have different nationality records over time due to political and historical reasons. This relates to employees from the former Soviet Union and former Yugoslavia. We can observe clearly that individuals from these source regions are likely to have different foreign nationalities throughout the whole observation period.¹⁴ Third, an algorithm is developed and implemented to replace the missing and inconsistent data concerning nationality within a single period.¹⁵ Fourth, inconsistent nationality information embedded between two periods is replaced (see Drews et al. 2007).¹⁶ Overall, as a result of the imputation steps the number of employees with multiple citizenship change is reduced substantially.¹⁷ Finally, we remove all employees with multiple citizenship change from our data set. By doing so, we ensure that individuals with ambiguous citizenship status are excluded from the analysis.¹⁸

¹² Regarding the education characteristic exist already a number of rules by which the quality of the variable can be improved (see Fitzenberger et al. 2006, Drews 2006).

¹³ For example: during the observation period changes the nationality of an employee from German to Turkish and back again. Drews et al. (2007) provides some useful algorithms which help to reduce the number of inconsistencies.

¹⁴ For example: until 1991 an individual is recorded as Yugoslavian citizen, and changes to Croatian nationality in 1992.

¹⁵ This is related to cases where an employee has different nationalities within one reporting period in parallel spells; e.g. Turkish in the main job, and German in the side job. The criterion used for the replacement of inconsistent data is the main job.

¹⁶ For example: If an employee had the German nationality in 1999 and 2001, but the Turkish nationality in 2000, the information was changed in 2000 to German.

¹⁷ In our selected sample exhibit 47% of the employees with at least one change in citizenship more than one nationality change over time, while the corresponding share after the additional cleaning procedures is almost halved to 25%. In absolute figures: Of the 34,893 individuals with at least one change in citizenship status over time have 16,374 employees changed nationality more than once. The corresponding figures after the data cleaning are 5,582 of 22,303. 96% of these 5,582 employees change only between two nationalities, e.g. Turkish and Yugoslavian.

¹⁸ Multiple citizenship change in the dataset might also be caused by employees with double citizenship, because their reported nationality presumably differs from case to case.

Furthermore, we exclude native employees from our data set.¹⁹ The same holds true for employees who change from a foreign nationality to another alien citizenship at a certain point of time or who expatriate. In addition to this, we removed employees who naturalize in 2004. This step is considered necessary given that we aim to estimate the impact of naturalization over time. Subsequently, the dataset contains only records of employees who have a foreign nationality throughout the observation period and foreign employees who naturalize at a certain point of time.²⁰ After this, cross-Sections are drawn for every year. This is carried out by using the annual notification of an employee at the end of every year, whereby only the information related to the main job is recognized. This ensures that every employee who works in two subsequent years is accounted for. Thus, the dataset contains, at the most, one notification per year for every employee. The final structure of the dataset is an unbalanced panel.

Due to the anonymization process the dataset provides no information about the age of employees who are, at a certain point of time, older than 62 or younger than 15. These people are marked throughout the entire data set with the category names “older than 62” or “younger than 15”. Therefore, an algorithm to approximate the age of these employees has been developed and implemented, which allows us to include these employees in our analysis.²¹ Regarding the education variable we make use of an imputation procedure developed by Fitzenberger et al. (2006).²² Furthermore, we have to deal with the issue of right-censored wages. Since the IAB employment sample data is generated from the social insurance accounts wages are only displayed up to the contribution limit of the social security. To avoid biased estimates a two-step procedure based on the approach of Gartner (2005) is implemented to impute the censored wages.²³ The Euro is selected as the uniform currency. Wages are deflated by using the consumer price index on the basis 2000.

¹⁹ A native employee is hereby defined as an individual who possesses a German passport throughout the entire observation period

²⁰ Before 1999 ethnic Germans, the so-called Aussiedler, have received the German citizenship without any precondition shortly after entering the country. Since 1999 they received the German passport automatically as soon as they entered Germany (see Steinhardt 2007). Our final data set therefore should contain no ethnic Germans.

²¹ For employees marked younger than 15, the date of birth is identified by subtracting 15 years from the first year of coverage, while the date of birth of employees marked elder than 62 is calculated by subtracting 65 years from the last year of coverage. The presumption underlying this procedure is that nobody younger than 14 or older than 65 years is included in the sample.

²² We decided to use imputation procedure 1 (IP1), which allows extrapolating degrees without any restrictions (see Fitzenberger et al. 2006). This procedure corrects amongst others for cases in which the educational achievement of employees decreases over time due to misreporting.

²³ In a first step the wage is estimated by a tobit-regression. The dependent variables are, among others, education, experience, occupational status, and economic sector. In a second step the censored wages are

One characteristic of the IABS is that it contains no variable describing the work experience of an employee. We decided to use the age of an employee as a proxy for his work experience. We further calculated an alternative experience measure based on the number of working days recorded in the sample. However, we prefer the first measure due to two reasons: Firstly, the average age of entry in the sample is for immigrants about 30. We therefore have to assume that most of the immigrants already have worked in their home country or even in Germany in jobs not covered by the social security system (e.g. part-time work, self-employed). Secondly, due to the sample construction of the IABS the dataset contains a large number of individuals that have been already full-time employees prior to 1975 (see Bender and Haas 2002). However, the data does not provide any information about the employment histories before 1975. Both cases imply that a measure solely based on the recorded employment spells heavily underestimates the experience of immigrants. For this reason, we use the second measure only within a subsample in the robustness section, in which we control for the age at sample entry.

Overall, the final dataset includes about 630,000 observations during the period 1975 to 2004, which correspond to more than 71,700 individuals. About 11% of all employees have acquired citizenship at a certain point of time (see table 1). In line with the overall trend depicted in figure 1, 86% of the recorded naturalizations took place between 1990 and 2003. On average, each employee is observed 8.8 times during the entire observation period. Whereas the minimum is 1 observation per person, the maximum observation period is 30 years. Concerning the differences between non-naturalized and naturalized immigrants, the latter group has a higher average observation period, which is beneficial for disentangling the wage growth pre- and post naturalization.

Table 1: Final data set

Period: 1975-2004	Persons		Spells		Years of coverage		
	Freq.	Perc.	Freq.	Perc.	Min	Max	Average
Employees	71,727	100	633,420	100	1	30	8.83
Foreigners	63,588	88.65	525,539	82.97	1	30	7.93
Immigrants who naturalize	8,139	11.35	107,881	17.03	2	30	13.25

Source: own calculations with data of the IAB employment sample 1975-2004

Table 2 shows selected individual characteristics of foreign and naturalized employees in the final year of the observation period. The figures clearly indicate that naturalized employees

imputed by adding an error term ε with the standard deviation σ to the expected wage. For the error term we take random drawings from a truncated normal distribution (see Gartner 2005).

possess a higher qualification profile than employees who retain their foreign nationality. While for example 30% of foreign employees recorded no apprenticeship, only 18% of the naturalized employees had no professional education. These results are consistent with other evaluations for Germany based on different data sources, such as the Microcensus (see Steinhardt 2007, p. 548). Furthermore, it becomes obvious that naturalized immigrants are on average 3.5 years older than foreign employees. This is driven by the fact that naturalization in the majority of the cases takes place between the age of 30 and 50.²⁴

Table 2: Individual characteristics, 2004

	Foreign employees	Naturalized Employees
Education (share in %)		
Without apprenticeship	30.50	18.34
Secondary school with apprenticeship	49.38	61.88
Abitur without apprenticeship	1.02	0.75
Abitur with apprenticeship	3.36	5.90
Degree from technical college	1.75	2.83
University degree	6.01	7.60
Missing	7.97	2.71
Mean Age	38.65 (10.70)	42.15 (9.68)
Occupational Status (share in %)		
Unskilled worker	56.92	45.42
Skilled worker	23.25	28.62
Foreman	0.58	1.42
White collar employee	19.25	24.53
Missing	0.00	0.00
Mean Wage	81.80 (39.48)	86.17 (40.25)

Standard deviation for age and wages in parentheses

Wages were deflated using the consumer price index of the former federal territory on the basis 2000.

Source: own calculations with data of the IAB employment sample 1975-2004

The discrepancy in the formal qualification of the two groups corresponds to differences in the occupational status (see lower part of table 2). The vast majority of the foreign employees are unskilled workers. The corresponding share within naturalized employees is with 45% considerably lower. On the other hand, about 19% of the foreigners are white collar employees, whereas almost every fourth naturalized immigrant belongs to this category. The table further shows that, on average, naturalized immigrants earn higher wages than foreign employees. With almost 4.5 Euros, the wage premium is quite substantial. This corresponds to large sociodemographic differences between the two groups.

²⁴ The average age of citizenship acquisition in the data set is 38.5. Differences to figures based on other data sources such as the naturalization statistics of the Federal Statistical Office are due to the fact that our data set is restricted to the male workforce liable to social insurance. Especially, the exclusion of children and young individuals who are still embedded in the educational system is driving the differences.

The descriptive findings indicate that immigrants are likely to be positively selected with respect to human capital. In addition to this, it has to be assumed that the probability for naturalization also varies with unobservable characteristics. Immigrants with positive unobservable characteristics, such as motivation or ambition, should have a higher preference for naturalization. The following empirical analysis therefore has to consider processes of self-selection on both observables and unobservables. In the next Section several econometric specifications will be estimated to analyse the relationship between naturalization and wages.

5 Results

The following estimations are based on a standard Mincer wage equation derived from human capital theory (see Mincer 1974). In this type of regression, the most important independent variables are education and labour market experience. Furthermore, we control for various sociodemographic and labour market characteristics. In the first part of the empirical analysis, a simple pooled OLS regression is carried out to gain initial insights about the impact of naturalization on wages. All observations are pooled together without taking the panel structure of the data into account. Therefore, this basic regression does not allow to control for processes of selection concerning unobservable characteristics.

The basic regression is given by the following equation:

$$(1) \quad \ln w_{it} = \alpha_0 + \alpha_1 N_{it} + \alpha_2 ED_{it} + \alpha_3 EX_{it} + \alpha_4 EX_{it}^2 + \alpha_5 Y_t + \beta \mathbf{Z}_{it} + \varepsilon_{it}$$

where the dependent variable $\ln w_{it}$ describes the average daily real wage of individual i at time t in logarithms. The naturalization of an individual is captured by the term N_{it} , which is a dummy that indicates whether an employee is naturalized at time t . It is not only set to unity in the year when the naturalization takes place, but also in all years after the naturalization act. This term captures the advantage of employees who acquired German citizenship. ED_{it} and EX_{it} describe the education and labour market experience of individual i over time. The inclusion of the term Y_t , which is a time dummy, allows to control for cyclical effects on the dependent variable. The term \mathbf{Z}_{it} is a vector of further control variables containing individual and macro characteristics, such as nationality, economic sector and region.²⁵ Table 5 shows the results for the basic pooled OLS regression.

²⁵ Vector \mathbf{Z}_{it} contains a term that controls whether an employee is of Turkish origin, belongs to a country of the European Union, respectively an associated state, or is a Third Country National. For a list of the EU and associated states see the appendix.

The variable of interest N_{it} is significant and has the expected sign. Because the basic reference category of the nationality variable is Third Country National, the results can be interpreted as follows: once we control for differences in human capital, naturalized employees earn 4.49% higher wages than Third Country Nationals.²⁶ The addition of occupational control variables reduces the size of the coefficient as expected. Finally, remains a significant wage advantage of naturalized immigrants over Third Country Nationals of 2.40%. However, occupational status and actual occupation could be already an outcome of naturalization.²⁷ Therefore we should treat these variables as endogenous and refrain from including them at the right hand side of the equation. In this case we should refer to the result in column 4 which give us a wage premium of 4.81%. The results of the pooled OLS indicate that the wage premium of naturalized foreigners can be to some extent be explained by differences in observable characteristics such as education and labour market experience.

Table 3: Pooled OLS 1975-2004

	(1)	(2)	(3)	(4)	(5)	(6)
Naturalized	0.1130** (0.0024)	0.0440** (0.0020)	0.0470** (0.0020)	0.0470** (0.0019)	0.0319** (0.0019)	0.0237** (0.0018)
R ²	0.03	0.32	0.33	0.34	0.38	0.44
Observations	632,059	632,059	631,986	631,138	631,138	630,167
Control Variables:						
Year	Yes	Yes	Yes	Yes	Yes	Yes
Nationality	Yes	Yes	Yes	Yes	Yes	Yes
Human Capital	No	Yes	Yes	Yes	Yes	Yes
Region	No	No	Yes	Yes	Yes	Yes
Economic Sector	No	No	No	Yes	Yes	Yes
Occupational Field	No	No	No	No	Yes	Yes
Occupational Status	No	No	No	No	No	Yes

Human capital includes education, labour market experience and its square, tenure and its square.

Reference category Nationality: Third Country National

Robust standard errors in parentheses

** significant at 1% level

rounded to 4. decimal place

Source: own calculations with data of the IAB employment sample 1975-2004

However, the pooled OLS analysis does not allow us to derive any conclusions about the causality links between naturalization and citizenship acquisition. It neither enabled us to observe how the individual wages change over time nor did we control for individual unobserved heterogeneity. We performed a Breusch-Pagan Lagrangian Multiplier Test and come to the result that the variance of the individual error term differs from zero, indicating

²⁶ $(\exp(0.0440)-1) = 0.0449$

²⁷ In section 3 we have outlined that the acquisition of citizenship is likely to increase the labour market opportunities in various ways.

that the estimation should indeed account for unobserved heterogeneity of the individuals (see Wooldridge 2002, pp. 264-265). We further ran a Hausman Test, which tests for a correlation between the time-constant error term and the exogenous variables (see Wooldridge 2002, pp. 251-252).²⁸ The result of the test supports the use of individual fixed effects. Following Bratsberg et al. (2002), a longitudinal analysis based on the following equation is carried out:

$$(2) \quad \ln w_{it} = \alpha_0 + \alpha_1 N_{it} + \alpha_2 N_{it} (EX_{it} - EX_{iN}) + \alpha_3 CA_i EX_{it} + \alpha_4 ED_{it} \\ + \alpha_5 EX_{it} + \alpha_6 EX_{it}^2 + \alpha_7 Y_t + \beta Z_{it} + \mu_i + \varepsilon_{it}$$

with μ_i describing the individual specific time invariant component of the error term and ε_{it} is an idiosyncratic disturbance. The inclusion of μ_i ensures that we control for unobserved individual heterogeneity such as ability or motivation.²⁹ The term CA_i is a time-constant dummy set to unity if the employee i naturalizes at a certain point during the observation period. EX_{it} denotes the labour market experience of the individual at time t , and EX_{iN} describes the experience of individual i at the time of the naturalization act.

In addition to the former equation, this approach allows to differentiate the effect of naturalization by time. The inclusion of the additional terms allows us to make detailed statements about the question by which channel the naturalization affects wages: If α_1 is positive, there is an immediate positive wage effect. In the case of a positive α_2 , the wage growth after naturalization is accelerated. Both outcomes could be explained by increased labour market opportunities as a result of possessing German citizenship. In the case of a positive α_3 , the wages of naturalized employees grow faster even before the naturalization act. This can be explained with an increased investment in human capital even prior to naturalization (see Bratsberg et al. 2002, p. 573).

Table 4 presents estimates of the three coefficients of equation (2) exploiting the whole data set. The results indicate that naturalization has an immediate positive effect on the wages of employees.³⁰ Naturalization leads to a statistically significant 0.65% boost in wages. In addition to this, the estimation shows that naturalized employees exhibit a rapid wage growth in the years after naturalization. Wage growth after naturalization is 0.41 percentage points

²⁸ Both test statistics are in the appendix.

²⁹ The individual specific term also controls implicitly for cohort-effects.

³⁰ The regression also includes dummies for EU ascension and the signing of bilateral agreement (see appendix). Due to the nature of our measure of potential experience it is not possible to include a full set year dummies (see Wooldridge 2006, p. 489). We could instead use T-2 year dummies under the identification restriction that the additional omitted year dummy has no impact on our dependent variable. However, various regressions have shown that the assumption does not hold true in our case. We therefore decided to control for time effects by using 6 quinquennial dummies (1975-1979, 1980-1984, 1985-1989, 1990-1994, 1995-1999, and 2000-2004).

higher per year. Reconsidering the fact that a foreign employee is on average 39 years old when he acquires the status of a German citizen reveals that the effect after naturalization is rather large. Both results are consistent with the argument that naturalization increases the labour market opportunities of immigrants in various ways. On the other hand, the results do not provide any evidence for accelerated wage growth prior to naturalization. The experience-earnings profile prior to naturalization seems not be steeper than the one of immigrants who do not naturalize at all.

Table 4: Fixed effects 1975-2004

Dependent variable: $\ln w_{it}$		
Naturalized	0.0065*	(0.0033)
Experience since naturalization	0.0041**	(0.0008)
Prior naturalization	-0.0007	(0.0004)
Experience	0.0397**	(0.0005)
Experience ²	-0.0004**	(0.000)
Observations		631,138
Individuals		71,450
R ²		0.30

Standard errors in parentheses robust to autocorrelation and heteroskedasticity.

Regressions also include tenure and its square, controls for federal states and economic sector, dummies for EU ascension/ bilateral agreement and quinquennial time dummies (reference category 1975-1979).

** significant at 1% level, * significant at 5% level

rounded to 4 decimal place

Source: own calculations with data of the IAB employment sample 1975-2004

As we outlined in Section 3.3 we distinguish between three groups of immigrants in the German labour market. Due to differences in legal status and labour market access we expect that the impact of naturalization varies among these groups. We therefore estimated equation (2) separately for each of the groups. The corresponding results in Table 5 show that the impact of becoming German indeed varies across Third Country Nationals, Turks and immigrants from an EU or associated state. For the last group the estimates cannot reveal any naturalization premium. On the contrary, immigrants from non-European states without privileged labour market access and Turkish immigrants profit from becoming German. However, Turks exhibit no immediate positive wage effect, while Third Country Nationals seem to experience a direct return to naturalization. The results further show that the wage impact after the acquisition of German citizenship has a much larger magnitude for Turkish immigrants. While non-naturalized Turks experience a return to experience of 4.1 percent per year of experience, naturalized Turks enjoy an annual return to experience of roughly 5 percent.

Table 5: Fixed effects by selected groups

Dependent variable: $\ln w_{it}$						
	(1) Third Country Nationals		(2) Turkish Nationals		(3) EU and privileged Third Country Nationals	
Naturalized	0.0107*	(0.0044)	-0.0020	(0.0073)	-0.0010	(0.0073)
Experience since naturalization	0.0033**	(0.0010)	0.0088**	(0.0025)	0.0027	(0.0015)
Prior naturalization	-0.0008	(0.0006)	-0.0007	(0.0007)	-0.0005	(0.0006)
Experience	0.0362**	(0.0011)	0.0408**	(0.0009)	0.0431**	(0.0009)
Experience ²	-0.0003**	(0.0000)	-0.0004**	(0.0000)	-0.0004**	(0.0000)
Observations	197,056		206,117		227,965	
Individuals	25,458		19,275		26,717	
R ²	0.24		0.33		0.33	

Standard errors in parentheses robust to autocorrelation and heteroskedasticity

Regressions also include tenure and its square, controls for federal states and economic sector, quinquennial time dummies and in column (3) dummies for EU ascension/bilateral agreement.

** significant at 1% level, * significant at 5% level

rounded to 4 decimal place

Source: own calculations with data of the IAB employment sample 1975-2004

The results for selected groups of immigrants highlight two features: the removal of existing labour market barriers and the change in legal status is an important channel by which naturalization affects the productivity of immigrants. Immigrants from the EU who enjoy unrestricted labour market access even without the German passport exhibit no wage gains from the acquisition of German citizenship. On the other hand, Third Country Nationals and Turks who both have to deal with constraints in the labour market appear to profit by the naturalization act. Furthermore, the difference in the magnitude of the post-naturalization coefficient between both groups indicates that the impact of naturalization goes beyond the removal of institutional disadvantages. As we know from the literature Turks are likely to be faced with discrimination in the German labour market (see Goldberg et al. 1996, Kaas and Manger 2010). Kaas and Manger (2010) demonstrate in a recent field experiment that discrimination of Turkish job applicants is reduced with the amount of information provided by the job applicants. As we argued in Section 3, the naturalization act contains a lot of valuable information for the employer and is therefore likely to increase the job chances of immigrants. The large impact of citizenship acquisition on future wage growth of Turks may therefore be due to the fact that naturalization helps to overcome statistical discrimination via signalling.

6. Robustness Checks

In this Section we test the robustness of our results in a number of ways. We start by adding the regional unemployment rate as an additional explanatory variable to equation (2). The corresponding results are provided in the second column of table 6, while the first column shows the results from our benchmark specification in table 4.³¹ It becomes obvious that the inclusion of region-specific trends neither changes the significance nor the magnitude of our post-naturalization coefficient. However, our coefficient of *Naturalized* becomes insignificant and the *Experience* coefficient gains in size. Second, we used an alternative measure of work experience which is the sum of age at sample entry and working days recorded in the sample (see as well Section 4). This specification yields as well a positive and significant coefficient for *Experience since Naturalization*; however the coefficient decreases in size. The other coefficients react in a similar way like in the first robustness check. As a third robustness test we included education as a further control in our benchmark. As a result, our coefficient for *Prior naturalization* becomes significant. This result is due to the nature of the education variable in the IABS which combines information about the highest school degree and the professional graduation of an employee. The latter might change during the employment history of an individual which makes it possible to include the education variable in a model with individual fixed effects. Without controlling for education the results indicate that immigrants who naturalize do not have a different wage-experience profile before the acquisition of citizenship than immigrants who not naturalize. As soon as we add education it becomes slightly flatter. This result implies that naturalized immigrants invest more in professional education prior to their naturalization than other immigrants.³² However, our main result of a positive naturalization impact on wage growth is not affected by the inclusion of education.

We turn next to consider in table 7 various robustness checks regarding the sample composition. In column (1) we restrict our sample to employees who have at least eight observations during the observation period. It becomes obvious that our main result of a positive wage impact after naturalization is not been driven by employees with a minor number of observations. However, our coefficient of *Naturalization* turns insignificant. The same holds true if we focus on employees who are not older than 25 when they enter the

³¹ The used regional unemployment measure relates only to immigrants and is calculated on the basis of the IABS.

³² The education dummies are significant and positive.

sample (column 2). Our coefficient for *Experience since Naturalization* remains significant and increases in size like the one for *Experience* of non-naturalized immigrants. Since we have restricted our sample to immigrants who had little or no labour market experience before entering the sample we are now able to use experience solely based on sample spells. The results in column (3) reveal that naturalization positively affects wage growth after naturalization. And once again we get a positive, but insignificant coefficient for *Naturalization*. Finally, we focus on individuals which are at least 30 years old when they enter the sample. This should ensure that we exclude native born second-generation immigrants, in particular children of guest-workers.³³ The results in column 4 show that our main result holds true if we only compare non-naturalized and naturalized immigrants who are both likely to be born outside of Germany. Overall, the alternative specifications have shown that the result of a positive impact of citizenship on wage growth is robust to the inclusion of additional explanatory variables, alternative experience measures and changes in the sample composition. On the other hand, the additional estimations do not support the result of a direct positive wage response to naturalization.

³³ The underlying assumption is that second-generation immigrants enter the German labour market before the age of 30.

Table 6: Robustness checks: explanatory variables

	(1) Benchmark	(2) incl. regional unemployment	(3) alternative experience measure	(4) incl. education
Naturalized	0.0065* (0.0033)	0.0054 (0.0033)	0.0023 (0.0033)	0.0041 (0.0033)
Experience since naturalization	0.0041** (0.0008)	0.0041** (0.0008)	0.0033** (0.0007)	0.0041** (0.0008)
Prior naturalization	-0.0007 (0.0004)	-0.0003 (0.0004)	0.0001 (0.0004)	-0.0008* (0.0004)
Experience	0.0397** (0.0005)	0.0442** (0.0006)	0.0490** (0.0006)	0.0380** (0.0005)
Experience ²	-0.0004** (0.0000)	-0.0004** (0.0000)	-0.0004** (0.0000)	-0.0004** (0.0000)
Observations	631,138	607,549	631,138	631,138
Individuals	71,450	69,487	71,450	71,450
R ²	0.30	0.29	0.30	0.30

Standard errors in parentheses robust to autocorrelation and heteroskedasticity.** significant at 1% level, * significant at 5% level

Regressions also include tenure and its square, controls for federal states and economic sector, dummies for EU ascension/ bilateral agreement and quinquennial time dummies. rounded to 4 decimal place

Source: own calculations with data of the IAB employment sample 1975-2004

Table 7: Robustness checks: sample selection

	(1) Min.8 observations/individual	(2) Age by sample entrance<=25	(3) Age by sample entrance <=25 & sample experience	(2) Age by sample entrance>=30
Naturalized	0.0036 (0.0035)	0.0089 (0.0054)	0.0106 (0.0054)	-0.0015 (0.0048)
Experience since naturalization	0.0043** (0.0008)	0.0059** (0.0013)	0.0048** (0.0013)	0.0034** (0.0012)
Prior naturalization	-0.0005 (0.0004)	-0.0001 (0.0006)	0.0003 (0.0006)	-0.0010 (0.0006)
Experience	0.0402** (0.0005)	0.0579** (0.0012)	0.0708** (0.0014)	0.0322** (0.0012)
Experience ²	-0.0004** (0.0000)	-0.0007** (0.0000)	-0.0007** (0.0000)	-0.0003** (0.0000)
Observations	510,833	228,122	228,122	290,413
Individuals	31,087	25,760	25,760	33,632
R ²	0.33	0.37	0.38	0.21

Standard errors in parentheses robust to autocorrelation and heteroskedasticity.** significant at 1% level, * significant at 5% level

Regressions also include tenure and its square, controls for federal states and economic sector, dummies for EU ascension/ bilateral agreement and quinquennial time dummies. rounded to 4 decimal place

Source: own calculations with data of the IAB employment sample 1975-2004

7 Conclusions

The analysis of the impact of naturalization has shown that citizenship is an economically relevant factor in Germany. The descriptive analysis exhibits a sizable wage premium for naturalized immigrants, but indicates that educational differences between naturalized and non-naturalized immigrants are an important determinant. It has become obvious that especially high qualified foreigners tend to naturalize. The estimation of a pooled OLS reveals that the wage premium of naturalized foreigners can be partly explained by differences in sociodemographic characteristics.

The longitudinal analysis, which enables us to control for self-selection concerning unobservable characteristics within the foreign workforce, demonstrates that the acquisition of citizenship has a positive impact on wages of immigrants. In particular, the fixed effects estimation shows that naturalized employees exhibit an accelerated wage growth in the years after the naturalization event. This result is robust to alternative specifications of the empirical model as well as to changes in the sample composition. Furthermore, the analysis highlights that the impact of becoming German varies across different groups of immigrants. While we do not find any impact for immigrants from EU or associated states, both Third Country nationals and Turks profit from acquiring German citizenship. We further find that the wage impact of naturalization has the largest size for Turkish immigrants. This supports our argument that naturalization can help to overcome statistical discrimination via signalling.

The findings of the analysis have clear implications for the integration policy in Germany. Until now, there was no empirical evidence for the role that naturalization plays in the economic assimilation process of immigrants. Our results now clearly demonstrate for the first time that naturalization has a significant impact on the assimilation in earnings. The argument that naturalization designates the end of a successful integration process is hereby falsified. Undisputedly, the naturalization act demands already certain integration from the immigrant, but it also enables to further integration by increased labour market opportunities. Therefore, naturalization is neither the beginning nor the end of integration, but an important part within the integration process. Policy makers can react to these findings by two ways: first by allowing unrestricted labour market access for all immigrants legally residing in Germany, irrespective of their passport. The other well-known solution would be to increase the naturalization rates, which are relatively low compared to other European countries. This

can be done by relaxing the requirements for naturalizations or by promoting the possibilities and advantages of naturalization within the immigrant population.

References

- Becker, Gary (1973): *The Economics of Discrimination*. University of Chicago Press, Chicago.
- Bender, Stefan; Haas, Anette (2002): Die IAB-Beschäftigtenstichprobe. In: Kleinherz, Gerhard (ed.): *IAB-Kompodium Arbeitsmarkt- und Berufsforschung, Beiträge zur Arbeitsmarkt- und Berufsforschung, BeitrAB 250*, Nuremberg: 3-12.
- Bevelander, Pieter; Veenman, Justus (2008): Naturalization and Socioeconomic Integration: The Case of the Netherlands. In: Bevelander, Pieter, DeVoretz, Don (eds.): *The Economics of Citizenship*, Malmo University Press, Malmo: 65-88.
- Bratsberg, Bernt; Ragan, James F.; Nasir, Zafar M. (2002): The Effect of Naturalization on Wage Growth: A Panel Study of Young Male Immigrants. *Journal of Labour Economics*, Vol. 20: 568-597.
- Brubaker, Rogers (1992): *Citizenship and Nationhood in France and Germany*. Harvard University Press, Cambridge.
- Cahuc, Pierre; Zylberberg, Andre (2004): *Labour Economics*. MIT Press, Cambridge.
- Chiswick, Barry (1978): The Effect of Americanization on the Earnings of Foreign-born Men. *The Journal of Political Economy*, Vol. 86: 897-921.
- DeVoretz, Don (2008): The Economics of Citizenship: A Common Intellectual Ground for Social Scientists? *Journal of Ethnic and Migration Studies*, Vol. 34: 679-693.
- DeVoretz, Don; Pivnenko, Sergiy (2005): The Economic Causes and Consequences of Canadian Citizenship. *Journal of Immigration and Integration*, Vol. 6: 435-468.
- Draws, Nils (2006): Qualitätsverbesserung der Bildungsvariable in der IAB-Beschäftigtenstichprobe 1975-2004. *FDZ Methodenreport*, Vol. 5, Nuremberg.
- Draws, Nils; Groll, Dominik; Jacobebbinghaus, Peter (2007): Programmierbeispiele zur Aufbereitung von FDZ Personendaten in STATA. *FDZ Methodenreport*, Vol. 6, Nuremberg.
- Duguet, E.; Leandri, N.; L'Horty, Y.; Petit, P. (2007): *Discriminations à l'embauche – Un testing sur les jeunes des banlieues d'Île-de-France*, Rapports et documents, Centre d'analyse stratégique, Paris.
- Federal Statistical Office Germany (2006): *Qualitätsbericht, Statistik/Bezeichnung, Vierteljährliche Bestandsauszählungen der sozialversicherungspflichtig Beschäftigten*. Wiesbaden.
- Fitzenberger, B., Osikominu, A., R. Völter (2006): Imputation Rules to Improve the Education Variable in the IAB Employment Sample. *Schmollers Jahrbuch*, Vol. 126: 405-436.
- Gartner, H. (2005): The Imputation of Wages above the Contribution Limit with the German IAB Employment Sample. *FDZ Methodenreport*, Vol. 2, Nuremberg.
- German Federal Government (2000): *4. Bericht über die Lage der Ausländer in der Bundesrepublik Deutschland*. Beauftragte der Bundesregierung für die Belange der Ausländer.
- Goldberg, Andreas; Mourinho, Dora; Kulke, Ursula (1996): *Labour Market Discrimination against Foreign Workers in Germany*. International Migration Papers 7, International Labour Office, Geneva.

- Hailbronner, Kay (2007): Diversity in the Labour Market: The Legal Framework and Support Services for Migrant Workers in Germany. HWWI Policy Paper No. 3-4.
- Kaas, Leo; Manger, Christian (2010): Ethnic Discrimination in Germany's Labour Market: A Field Experiment. IZA Discussion Paper No. 4741.
- Kogan, Irena (2003): Ex-Yugoslavs in the Austrian and Swedish Labour Markets: The Significance of the Period of Migration and the Effect of Citizenship Acquisition. *Journal of Ethnic and Migration Studies*, Vol. 29: 595 – 622.
- Locke, John (1690): *Two treaties of government*, London.
- Mazzolari, Francesca (2009): Dual Citizenship Rights: Do They Make More and Richer Citizens? *Demography*, Vol. 46: 169-191.
- Mincer, Jacob (1974): *Schooling, Experience, and Earnings*. Columbia University Press, New York.
- Mincer, Jacob; Polachek, Salomon (1974): Family Investments in Human Capital: Earnings of Women. *Journal of Political Economy*, Vol. 84: S76-S108.
- Scott, Kirk (2008): The Economics of Citizenship: Is there a Naturalization Effect? In: Bevelander; Pieter, DeVoretz, Don (eds.): *The Economics of Citizenship*, Malmo University Press, Malmo: 107-126.
- Spence, Michael A. (1974): *Market signalling: Informational Transfer in Hiring and Related Screening Processes*. Harvard University Press, Cambridge.
- Steinhardt, Max (2007): Aktuelle Trends der Einbürgerungen in Deutschland. *Wirtschaftsdienst*, Vol. 87: 544-549.
- Wooldridge, Jeffrey M. (2002): *Econometric Analysis of Cross Section and Panel Data*. MIT Press, Cambridge.
- Wooldridge, J.M. (2006): *Introductory Econometrics, A Modern Approach*. Thomson South Western, Mason/Ohio.
- Yang, Q. Philip (1994): Explaining Immigrant Naturalization. *International Migration Review*, Vol. 28: 449-477.

Appendix

Test Statistics

Breusch-Pagan LM test	$\text{chi2}(1) = 9.90\text{E}+05$	Prob > chi2 = 0.0000
Hausman test	$\text{chi2}(1) = 260.44$	Prob > chi2 = 0.0000

Classification of states

European Union	Associated states
Belgium, Denmark, France, Ireland, Italy, Luxembourg, Netherlands, Great Britain	Switzerland, United States
From 1981 on: Greece	From 1986 on: Iceland, Liechtenstein, Norway
From 1986 on: Portugal, Spain	From 1990 on: Australia, Canada, Israel, Japan, New Zealand
From 1995 on: Austria, Finland, Sweden	