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Does citizenship matter? The economic impact of naturalizations in Germany

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Hamburg Institute
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Max Friedrich Steinhardt

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Does citizenship matter? The economic impact of naturalizations in Germany

Max Friedrich Steinhardt*

The paper analyzes whether citizenship acquisition affects the labor market performance of immigrants in Germany. Up to the present, there is no empirical evidence about this question for Germany. Theoretically, naturalization can increase the productivity by enabling unrestricted access to the labor market. Furthermore, naturalization can increase the labor market opportunities of immigrants by a reduction of administrative costs for the employer. Eventually, the willingness to invest in human capital may increase with the decision to naturalize, which would boost productivity even prior to naturalization.

A drawback of most conducted studies for the US, Canada or the Netherlands is that they are based on cross-sectional data. This disables the possibility to control for processes of self-selection within the group of immigrants and to identify the impact channel. In the following the study uses data from the IAB employment sample which allows conducting cross-sectional and panel analysis.

The descriptive analysis reveals strong processes of self-selection within the immigrant workforce concerning the naturalization decision. The estimates from a simple OLS estimation indicate a wage premium of naturalized immigrants, whereas the impact for Third Country Nationals has the largest size. Panel estimations show an immediate positive naturalization effect on wages. Furthermore they indicate accelerated wage growth in the years after the naturalization. It is a question of integration policy whether this passport advantage in the assimilation process is intended.

Keywords: Naturalization, economic impact, self-selection, socioeconomic integration.

JEL Classification: J31, J61, J68

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1 Introduction

The topic of citizenship has had a long tradition within the political philosophy and occupies a central position in the social contract theory of the modern moral and political theory. The socio-political importance of citizenship in the civic society was amongst others emphasized by John Locke (1690) who distinguishes between active and passive membership in a society. He argues that only the access by explicit commitment and contract makes an individual to a full member of a nation state. This position has by now entered in almost all legal systems of modern states, which differentiate their inhabitants in natives and foreigners. While the possibility of acquiring citizenship differs by country, all states have in common that the citizenship status is connected with a number of legal rights. An example is the electoral law which is a typical political right associated with citizenship. For this reason naturalization, which is defined as the acquisition of citizenship by a foreigner, can affect the socio-economic integration of immigrants in a country in various ways.

Whereas social scientists spent significant effort to analyze the political and sociological implications of naturalizations, economists neglected this topic a long time.¹ One of the first economic studies that deals with the topic of citizenship is from Chiswick (1978), who analyzes the economic assimilation of immigrants. Using cross-sectional data of 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 found a positive effect of naturalization on earnings that gets insignificant when he controls for years of residence. During the last years a number of economists have been dealing with the question of naturalization. However, most of them are analyzing the situation in the U.S. or Canada (see Bratsberg et al. (2002), DeVoretz and Pivenenko (2004), DeVoretz and Pivenenko (2005), DeVoretz (2006), Mazzolari (2007)). For European countries only few empirical findings exist about the economic impact of naturalizations like the study of Kogan (2003) for Austria and Sweden, Bevelander (2006) for the Netherlands and Scott (2006) for Sweden.

A drawback of most conducted studies is that they are based on cross-sectional data, which disables the possibility to control for processes of self-selection within the group of immigrants. The study of Bratsberg et al. (2002) is the first which uses cross-sectional as well as longitudinal data to estimate the effect of naturalization on wage growth of foreign-born men. The authors come to the result that naturalization has a significant positive effect on the

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

earnings of immigrants even after controlling for differences in unobserved individual characteristics. Bratsberg et al. (2002) show that wage growth accelerates after the acquisition of citizenship indicating barriers to certain jobs for immigrants without U.S. citizenship. In his longitudinal analysis for Sweden, Scott (2006) finds as well a positive effect of naturalization on wages of immigrants. In contrast to the findings of Bratsberg et al. (2002), he comes to the conclusion that the true naturalization premium of immigrants is largely caused by selection on part of the individual and not by legal implications. For the case of Germany, there is up to the present no empirical evidence about the question whether the acquisition of citizenship has any effects on the labor market outcome of immigrants. Furthermore, it remains unclear in how far unobserved characteristics could be responsible for naturalized immigrants wage premium. The present paper tries to generate original findings to this open question by estimating the impact of naturalization on wage growth of immigrants in Germany. The data used are actual official micro data and come from the employment sample of the institute for employment research (IAB). The econometric analysis will contain cross-sectional and panel data techniques which allow disentangling effects of self-selection and legal impact of citizenship acquisition.

The rest of the paper is organized as follows: Chapter 2 sketches naturalizations in Germany by presenting the legal framework and the quantitative dimension. Chapter 3 contains some theoretical considerations about the relationship between legal status and labor market performance. The data and the basic preparation steps are presented in chapter 4. In chapter 5 descriptive statistics are presented. Chapter 6 contains the results of pooled and longitudinal estimations. The paper ends with chapter 7 containing conclusions and 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 through the principle of *Jus Sanguinis*, the principle of descent. According to this, citizenship is recognized by any individual who is born to a parent who is a national or citizen of Germany. Foreigners had no entitlement to naturalize derived from law. Birth and prolonged residence in Germany did not establish any right to access German citizenship. The only possibility to acquire citizenship for foreigners was to marry a German person or to get an extraordinary entitlement by the relevant official authority (see Brubaker 1992, pp. 77-84).

After first changes in the alien legislation in 1990, the legal situation in Germany changed substantially in 1999 when a reform of the citizenship law was conducted. The reform adds the Principle of Jus Soli to the existing law. By this, children of immigrants who are born in Germany attain by birth the German passport. A special arrangement in Germany is that they can keep the citizenship of their parents till the age of 23. Not later than this age they have to decide between one of the two citizenships. This solution is the so called option model. Furthermore, the new law comprehends for every foreigner the entitlement to naturalize if he fulfils a number of requirements. These requirements are: residence of almost 8 years in Germany, possession of an appropriate residence permit, sufficient knowledge of 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 give up their previous citizenship.² During the last years this has been the most frequently used channel by which immigrants naturalized in Germany (see Steinhardt 2007, pp. 544-545).

2.2 Quantitative dimension

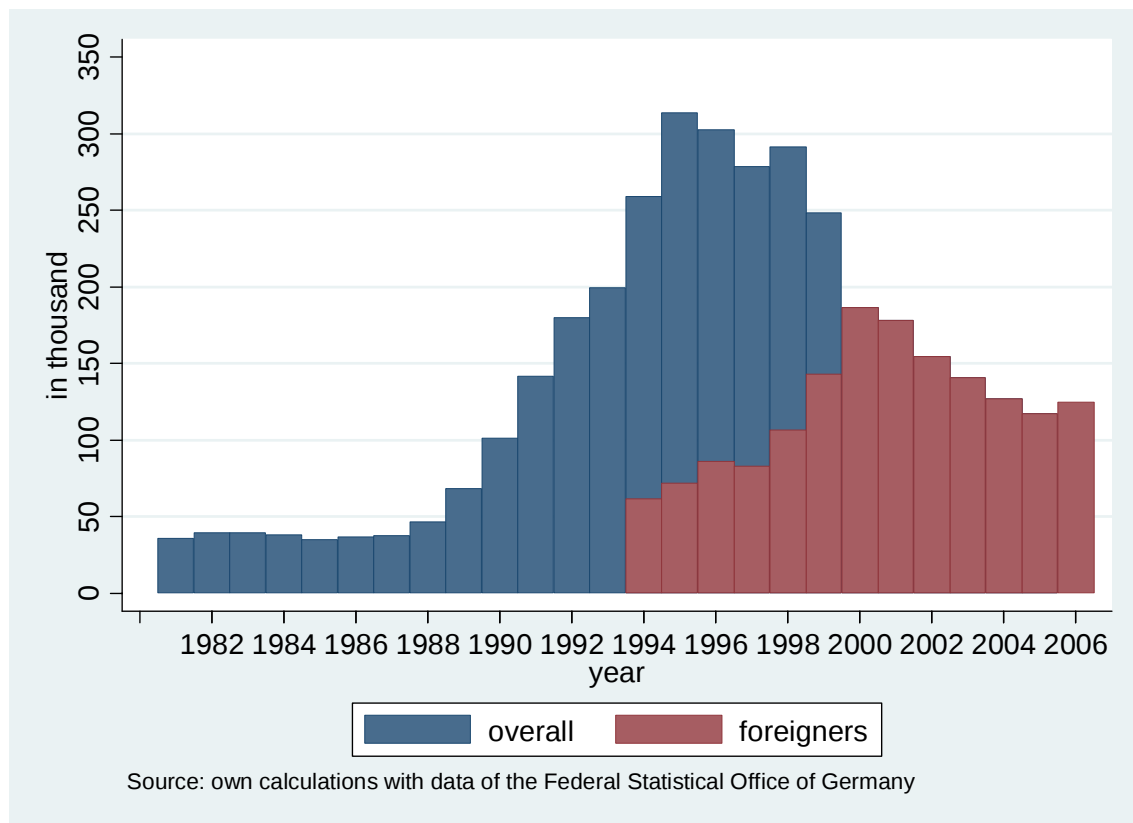
Figure 1 shows the number of annual naturalizations in Germany during the period 1980 to 2006.³ It becomes obvious that naturalizations played a minor role during the 1980s with less than 50,000 naturalizations per year. With the beginning of the 1990s, the picture changes and the number of naturalizations increased continuously with a peak in 1995 when 313,000 people acquired the German citizenship. For the understanding of the following decline in the overall number of naturalizations it is crucial to distinguish between foreigners and ethnic Germans the so-called Aussiedler (see Steinhardt 2007, pp. 545-546). Due to legal reasons Aussiedler were formally naturalized till 1999, although they have de facto been already German when they entered the country. For this reason, the diagram shows separately the number of foreigners that naturalized.⁴ With the coming into effect of the citizenship law the numbers of naturalization of foreigners increased strongly. Although till 2000 the number of naturalizations declined almost every year, it is remarkable that between 1999 and 2006 on average 150.000 foreigners per year decided to become German citizens. Overall almost 1,600,000 foreigners naturalized during the period 1994 and 2006.

² For this requirement exists a set of exceptions.

³ The data used is from the Federal Statistical Office of Germany.

⁴ The Federal Statistical Office publishes no detailed numbers of naturalized foreigners. The numbers are 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 reconstructable due to legal reasons.

Figure 1: Naturalizations in Germany 1980-2006

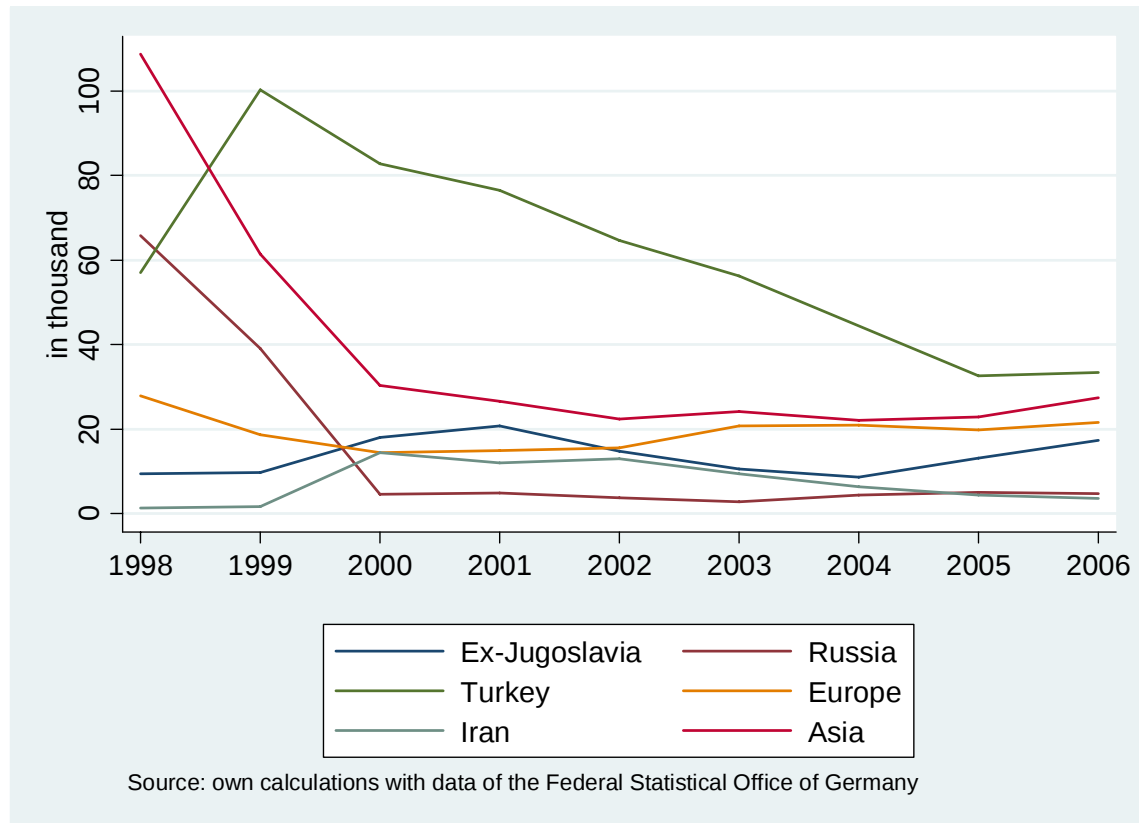


For the interpretation of these figures it is necessary to incorporate the size of the foreign population within the country. This is done by the naturalization rate which is defined as the number of naturalizations in relation to the number of foreigners within the country. It now becomes obvious that the share of immigrants in Germany who naturalize is relative low compared to other European countries. While the naturalization rate in Germany was in 2000 1.7% and in 2005 2.6% countries like Sweden (2003/7.3%), the Netherlands (2001/6.8%), Austria (2003/5.9%) and Denmark (2004/5.6%) exhibit significant higher naturalization rates (see Steinhardt 2007, p. 547).

Figure 2 shows naturalizations during the period 1998 and 2006 by selected countries and regions of origin. The diagram shows that persons with Turkish origin constitute the largest ethnic group within the naturalizations in every year. That is consistent with the fact that Turks are the largest group within the foreign population in Germany. Furthermore, it becomes obvious that the number of naturalized Turks has been decreasing since 1999. This is complained by various Turkish associations within Germany who interpret this as a sign for a lack of socioeconomic integration. The strong decrease in naturalizations from Russian and Asian people since 1999 can be explained with the mentioned change in data collection by the

official authorities. Within the group of Asian countries, especially Iran, Lebanon and Afghanistan exhibit high naturalization numbers. Together with people from Ex-Yugoslavia these groups are mainly responsible for the increase in naturalizations since 1999.

Figure 2: Naturalizations by country/region of origin



3 Legal status and labor market performance

In the following, some theoretical concepts and notions are presented that could explain why the naturalization could change the economic well-being of an immigrant. Since in many cases this depends strongly on the legal requirements and consequences of naturalization within a country, the following lines refer explicitly to the situation in Germany. In general, it can be distinguished between three groups of immigrants working and living in Germany: citizens of the European Union, nationals of associated states like Turkey and Third Country Nationals (see Hailbronner 2007, pp. 3-4). The fact that the legal status and labor market access differ strongly for all groups has to be considered in the empirical analysis. In the following, it is not dwelled on the distinction between these three groups since the possible influences of citizenship acquisition should be discussed more generally.

The first obvious channel by which naturalization can affect the productivity is unrestricted access to the labor market (see Yang 1994, pp. 452-453; Bratsberg 2002, pp. 569-570). Due to legal reasons a number of jobs in the public sector presuppose the possession of the German passport. For example, activities in the justice, national defense and in the direction of administration are in general reserved to German citizens.⁵ To some extent this also holds for certain jobs within the independent personal services like dentists, doctors, pharmacists, lawyers and architects. However, these restrictions of professionalism do not apply for European citizens.⁶ Furthermore, a number of jobs require unrestricted mobility of employees without 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, the naturalization reduces institutional and functional labor market barriers and enables free job choice of immigrants.

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 happens in two ways. First, naturalization results in a decline of 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 has an employer who wants to engage a foreigner from outside Europe 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).⁷ This fact has already been raised by the German Federal Government in its annual report in 2000, when it pointed out that employers abstain from employing foreigners due to legal and bureaucratic hurdles. Second, the 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 employee. In the case of an employee with foreign nationality the employer has to consider that the residence or work permit may not be renewed. In the worst case scenario the foreign employee has to leave Germany. Both

⁵ This regulation applies as well to EU citizens. The general possibility for EU citizens to become civil servants can be restricted for strict sovereign activities (see §39 section 4 Treaty establishing the European Community (TEC)).

⁶ Thanks to Marcel Kau from the University of Konstanz, who helped to clarify the actual legal situation in Germany.

⁷ The test guarantees the so-called primacy of natives ("Inländerprimat"), which is part of the foreigner legislation in Germany since 1965.

considered aspects have the consequence that an employer, who has the choice between two job applicants with equal qualifications and skills, prefers the one with the German passport.

In the literature about naturalization impacts the first part of this cost reduction argument was already taken up (see Bratsberg et al. 2002, p. 569; Mazzolari 2007, p. 20). In general, it is associated with the phenomenon of discrimination. However, following Becker's (1973 pp. 13-17) definition this behavior of the employer cannot be judged as discriminatory. The higher administration 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 that sums up to the market wage rate (see Becker pp. 39-40). However, in contrast to the U.S. by law legally employed foreigners are in Germany treated equally to natives in the job. This is true for aspects of employment provisions as well as for trade union agreements (see Hailbronner 2007, p. 20). Overall, it can be resumed that naturalization can increase the labor market opportunities of an employee with migration background in several ways. Due to legal equalization within Europe the distinction is to a lesser extent having a German or a foreign nationality, but being a member of a European Union country or a Third Country National.

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, has already lived for a number of years within the country, commits to the German constitution and has been able to support himself without recourse to 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 labor market is connected with an extent of uncertainty from the perspective of the employer prior to 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 facts about the individual to which the employer has access prior to hiring. In general, these are education, employment history and personal characteristics. While some of these characteristics, e.g. education, are partially or completely controllable by the individual, others are not (e.g. sex). 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 recovers a

significant information potential if it is not determined by birth. The naturalization act therefore can be interpreted as form of a signaling device, which can be used by employers for selection purposes.

An aspect by which the productivity of employees can increase directly is again connected to the decision to naturalize. From the perspective of the individual the naturalization act can be interpreted as a long term location decision. For this reason it is a plausible assumption that with the naturalization decision the willingness increases to invest in human capital. The individual who plans to stay in a country over a longer period or for lifetime will begin to foster his investment in education, language and country specific skills. This accumulation of human capital should have a positive impact on labor market performance and will lead to assimilation in earnings to natives. The following empirical analysis will try to address these different impact channels by integrating the time dimension and occupation explicitly in the analysis. If naturalization has a positive impact on labor market opportunities naturalized employees should exhibit some change in the labor market success after the naturalization. If on the other hand the increased investment in human capital of naturalized persons affects the productivity positively employees should already feature stronger wage growth before the acquisition of German citizenship.

4 Data

The data is from the current version of the employment sample of the IAB, which is a 2 percent random sample of all employees covered by social security during the period 1975 to 2001. According to this restriction the sample comprehends no self-employed, family workers and civil servants. Overall the dataset covers more than 20 million observations and represents about 80% of the employees in Germany. The sample contains various sociodemographic variables on the individual level like daily wage, education and age (see Bender and Haas 2002). The legal basis of the dataset is the integrated reporting procedure regarding pension, unemployment and health insurance.⁸ Therefore, the data are highly reliable in comparison to survey data. However, the reliability differs between particular variables.

⁸ The reporting procedure demands from every employer that he notifies all employees that 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. Afterwards 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 Bender et al. 1996, pp. 4-5, Federal Statistical Office Germany 2006, p. 6).

Generally, it can be distinguished between characteristics that are collected due to 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. This entails that employer and employee are interested in an accurate description.⁹ Furthermore, the declaration of the employee is checked by the social insurance companies, the pension fund and the employment agencies through various plausibility tests.¹⁰ In contrast to this, the reliability of the statistical characteristics that are related to the employee relies nearly completely on the accurateness of the employer.¹¹ The 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 error are possible: wrong information is recorded or wrong information is transferred (see Cramer 1985 pp. 62-65, Koch and Meineken 2003 pp. 160-162, Drews 2006 pp. 4-6). This leads to a substantial degree of inconsistency in the data concerning all individual characteristics that are not related to payments.

A result of this misrepresentation is that a number of employees in the database have more than one change of citizenship during the whole observation period.¹² For this reason, various procedures had to be implemented 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 was imported. This reduced the number of missings significantly, since the anonymous version contains information about the nationality of employees from the New Laender as well. Secondly, an algorithm was developed and implemented to replace missings and inconsistent data concerning the nationality within one period.¹³ Thirdly, all nationality information that was embedded between two periods was replaced.¹⁴ The result of the implementation of these methods was a reduction of employees with multiple citizenship change.¹⁵ However, the share of this group still remains quite high. For the regression no additional data preparation was conducted, since every data adjustment raises the risk of introducing new errors. For additional

⁹ The employee gets a copy of the report that is sent by the employer to the social insurance companies.

¹⁰ Since 2001 a common programme called “Kernprüfprogramm” is used by the social insurance carriers to check the accurateness of the reported information.

¹¹ Statistical characteristics of the company are collected by specialists of the employment agencies.

¹² For example: during the observation period changes the nationality of an employee from German to Turkish and back again. Furthermore, multiple citizenship in the dataset maybe caused by a relative high number of foreigners in Germany with dual citizenship. It has to be assumed that the captured nationality of these employees differs case by case.

¹³ The used criterion for the replacement of inconsistent data was the main job.

¹⁴ For example: If an employee had the nationality German in 1999 and 2001, but the nationality Turkish in 2000, the information was changed in 2000 to German.

¹⁵ At this point I like to thank Nils Drews from the IAB, who provided me with some useful algorithms.

estimations, further approaches shall be used to improve the reliability of the nationality variable.

In the following, various procedures were implemented which allow to identify time, number and direction of citizenship change. All persons from the dataset with permanent German nationality were removed. In addition to this, employees who exhibit multiple citizenship change, who changed from a foreign nationality to another alien citizenship or who expatriated were erased from the dataset.¹⁶ After this, cross-sections were drawn for every year. This was done by using the annual notification of an employee at the end of every year whereas only the information of the main job was recognized.¹⁷ Afterwards the dataset contains for every employee maximal one notification per year. The final structure of the dataset is an unbalanced panel.

Work experience were approximated by subtracting the average age of labor market entrance from the actual age of an employee by education categories using data from the IAB education report (see Reinberg and Hummel 1999). Due to anonymization purposes the dataset gives no information about the age of employees who are at a certain point of time older than 62 or younger than 15.¹⁸ For this reason, an algorithm was developed and implemented to approximate the age of these employees. For people marked younger than 15 the date of birth was identified by subtracting 15 years from the first year of coverage, while the date of birth of employees marked elder than 62 was 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 covered by the sample. Especially the last supposition does not seem to be very realistic, but this pragmatic approximation allows to include the lower and upper age groups. Since the employment sample does not contain any information about hours worked only fully employed people were considered in the data set. Eventually, the sample was restricted to men, because of the significant differences between men and women concerning the employment history.

Overall, the dataset includes about 500.000 observations during the period 1975 to 2001 which correspond to more than 60,000 individuals. About 11% of all employees have acquired citizenship at a certain point of time (see appendix 1). On average, each employee is observed 15 times during the whole observation period. While the minimum lies at 1

¹⁶ The last is related to people with original German nationality who acquired a foreign nationality at some point of time.

¹⁷ The advantage of using the annual notification is that every employee who works over two years is captured.

¹⁸ These people are marked throughout the whole data set with the category older than 62 or younger than 15.

observation, the maximum observation period is 27 years. Concerning differences between non-naturalized and naturalized immigrants the last group exhibits a higher average observation period which is beneficial for disentangling wage growth pre and post naturalization.

5 Descriptive statistics

Table 1 shows the education background of foreign and naturalized employees in Germany for the period 1975 to 2001. The figures clearly indicate that employees who naturalize possess a higher qualification profile than employees with a foreign nationality. However, the figures do not differentiate between time before and after naturalization. Therefore, the figures mean that during 1975 and 2001 on average 50.86% of the foreign employees recorded no apprenticeship, while only 33.47% of employees who decided to naturalize at a certain point of time have no professional education. The difference in education becomes apparent in the category university degree, where the fraction is within the group of naturalized employees more than two times higher than within the group of foreign employees. These results are consistent with other evaluations for Germany on the basis of different data sources like the microcensus (see Steinhardt 2007, p. 548).

Table 1: Sociodemographic characteristics of foreigners and naturalized immigrants

	Foreign employees	Naturalized employees
Education (share in %)		
Without apprenticeship	50.86	33.47
Secondary school with apprenticeship	26.84	41.96
Abitur without apprenticeship	0.61	0.94
Abitur with apprenticeship	0.74	1.77
Technical college degree	0.91	2.36
University degree	2.50	5.43
Missings	17.53	14.06
Occupational Status (share in %)		
Apprenticeship	3.17	5.17
Unskilled worker	59.46	40.03
Skilled worker	25.79	28.64
Foreman	0.42	1.14
White collar employee	9.42	22.09
Home work	0.02	0.03
Part-time work	1.69	2.06
Missings	0.02	0.02

Source: own calculations with data of the IAB employment sample 1975-2001

The big discrepancy in the formal qualification of the two groups corresponds with differences in the occupational status of naturalized and foreign employees in Germany (see

lower part of table 1). Only 10% of the foreigners are white collar employees, whereas 22% of the naturalized immigrants belong to this category. The vast majority of the employees without a German passport are unskilled workers. Surprisingly, within both groups the fraction of foreman is very small, while the share of skilled workers is nearly the same (26-29%). The disparity between both groups, therefore, relates mostly on the lowest and highest occupational categories.

Table 2 shows that the average age of a foreign employee is 39 when he acquires the status of German citizenship. Compared to the results of other studies this age is relatively high. This can be explained by the fact that the dataset is restricted to the male workforce liable to social insurance. Other data sources like the naturalization statistics of the Federal Statistical Office contain all groups of the population. Especially the inclusion of children and young individuals who are still in the educational system leads to a lower average age of the naturalized migrants in these data sets.

Table 2: Average age at naturalization

	Average age	Min	Max
Age at naturalization	38.98 (10.51)	16	65

Standard deviation in parentheses

Source: own calculations with data of the IAB employment sample 1975-2001

It may be expected that the difference in formal qualification and occupational status between foreign and naturalized employees is reflected in wages. For this reason table 3 shows the average annual wages for both groups. It becomes obvious that on average naturalized employees earn higher wages than foreign employees. With 4 Euros the wage premium is quite huge. This corresponds to large sociodemographic differences between both groups. For comparison the table also presents the average wage of German employees.¹⁹ As expected, the average wage of Germans without a foreign background is higher than of foreigners and as well as of naturalized foreigners. The interesting question is, whether the naturalization act itself has an impact of the economic performance of migrants. Therefore, the lower part of table 3 exhibits the wages of employees who naturalize before and after the act of citizenship acquisition.

¹⁹ For this purpose all elementary data preparation steps were conducted without erasing the German employees from the sample.

Table 3: Average daily wages

	Average daily wage (in Euro)
Foreign employees	67.38 (22.79)
Naturalized employees	71.03 (27.67)
German employees	77.72 (25.56)
Before naturalization	68.24 (26.62)
After naturalization	77.20 (28.96)

Standard deviation in parentheses

Wages were deflated by using the consumer price index of the former federal territory on the basis 1995.

Source: own calculations with data of the IAB employment sample 1975-2001

The figures show that on average employees who naturalize already earn higher wages before the naturalization act compared to foreigners who do not naturalize at all. However, the wage premium is relative small. In contrast to this, the average wage after the citizenship acquisition is considerable higher than before the naturalization and than the average wage of foreigners. This could be a first indicator that citizenship plays a substantial role on the German labor market. The following empirical analysis has to consider processes of self-selection within the group of immigrants. For instance, the mapping of the qualification structure has shown that the probability for naturalization differs between educational groups. In addition to this it has to be assumed that the probability for naturalization also varies concerning unobservable characteristics. Foreigners with positive unobservable characteristics like motivation or ambition should have a higher preference for naturalization. In the next section various regressions will be estimated that allow controlling for observable and unobservable characteristics of the employees to analyze this relationship more deeply.

6 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 labor market experience. Furthermore, it is controlled for a number of sociodemographic and labor market characteristics. In the first part of the empirical analysis a simple pooled OLS regression is carried out to gain first 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 self-selection concerning unobservable characteristics.

The basic regression is based on the following equation:

$$(1) \quad \ln w_{it} = \alpha_0 + \alpha_1 N_{it} + \alpha_2 ED_{it} + \alpha_3 EX_{it} + \alpha_4 EX_{it}^2 + \alpha_5 Y_t + \alpha_6 Z_{it} + \varepsilon_{it}$$

where the dependent variable $\ln w_{it}$ describes the average daily 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 indicating if 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 labor 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 Z_{it} is a vector of control variables containing individual and macro characteristics like occupation, occupational status, economic sector, region and nation.²⁰

Table 4 shows the results for the basic pooled OLS regression.

Table 4: Pooled OLS 1975-2001

	(1)	(2)	(3)	(4)	(5)	(6)
Naturalized	0.0585* (0.0026)	0.0587* (0.0027)	0.0627* (0.0027)	0.0346* (0.0025)	0.0230* (0.0023)	0.0195* (0.0022)
R ²	0.4441	0.4516	0.4647	0.5324	0.5853	0.6233
Control Variables:						
Human Capital	Yes	Yes	Yes	Yes	Yes	Yes
Nationality	Yes	Yes	Yes	Yes	Yes	Yes
Year	No	Yes	Yes	Yes	Yes	Yes
Region	No	No	Yes	Yes	Yes	Yes
Occupational Status	No	No	No	Yes	Yes	Yes
Occupation	No	No	No	No	Yes	Yes
Economic Sector	No	No	No	No	No	Yes

Number of observations: 507.325

Robust standard errors in parentheses

* significant at 1% level

rounded to 4. decimal place

Source: own calculations with data of the IAB employment sample 1975-2001

²⁰ Vector Z_{it} contains a term that controls whether an employee is of Turkish origin, belongs to a country of the European union or is a so called Third Country national.

The variable of interest N_{it} is significant and has the expected sign. Since the basic reference category of the naturalization and nationality variable is Third Country National, the results can be interpreted as follows: Naturalized employees earn 6.02% higher wages than Third Country Nationals.²¹ The addition of the other control variables reduces the size of the coefficient as expected. In the end remains a significant wage advantage of naturalized immigrants over Third Country Nationals of 1.97%. It therefore becomes obvious that the huge wage premium of naturalized foreigners can be largely explained by differences in observables characteristics like education and occupation. The results of the pooled OLS estimation indicate, nevertheless, that naturalization has a positive impact on the wages of employees.

Table 5 shows the results of the naturalization effect for selected national groups including the full set of control variables.²² It becomes obvious that the naturalization effect has the biggest size for Third Country Nationals. Employees with a former nationality of a country outside of Europe earn 3.62% higher wages than non naturalized Third Country Nationals.

Table 5: Pooled OLS by selected groups

	Third Country Nationals	Turkish Nationals	EU Nationals
Naturalized	0.0356* (0.0029)	0.0082 (0.0056)	-0.0612* (0.0046)
R ²	0.5911	0.6727	0.6317
N	189,262	176,717	140,158
Control Variables: Human capital, year, region, occupational status, occupation, economic sector			
Robust standard errors in parentheses			
* significant at 1% level			
rounded to 4. decimal place			
Source: own calculations with data of the IAB employment sample 1975-2001			

Furthermore, the estimates cannot reveal a naturalization premium of Turks. This can be explained by the fact that the labor market access for this group is more generous than for Third Country Nationals due to a number of bilateral agreements between Germany and Turkey. In addition to this, the estimates exhibit that naturalization seems to have a relative

²¹ $(\exp(0.0585)-1) = 0.0602$

²² For the classification of foreign groups within Germany see chapter 3.

strong negative impact effect for EU foreigners.²³ This is an interesting result indicating a negative self-selection process within the group of EU foreigners. Overall, the results show that especially groups with strong constraints on the labor market seem to profit by the naturalization act. Legal status and labor market access therefore seem to be the most important channel by which naturalization affects the productivity of immigrants.

However, the cross-sectional analysis did not allow us to observe how the individual wages change over time nor did we control for individual heterogeneity. A conducted Breusch-Pagan Lagrangian Multiplier Test comes to the result that the variance of the individual error term differs from zero indicating that the estimation should account for unobserved heterogeneity of the individuals (see Wooldridge 2002, pp. 264-265). Following Bratsberg et al. (2002) a longitudinal analysis based on the following equation is carried out:

$$(2) \quad \ln w_{it} = \alpha_0 + \alpha_1 N_{it} + \alpha_2 N_{it} (EX_{it} - EX_{iN}) + \alpha_3 CA_i EX_{it} + \alpha_4 ED_{it} \\ + \alpha_5 EX_{it} + \alpha_6 EX_{it}^2 + \alpha_7 Y_t + \alpha_8 Z_{it} + \mu_i + \varepsilon_{it}$$

with μ_i describing the individual specific time invariant component of the error term and the idiosyncratic disturbance ε_{it} . 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. While EX_i denotes the labor market experience of individual at time t , 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 facilitates to make detailed statements about the question by which channel the naturalization affect 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 the naturalization is accelerated. Both cases could be explained by the increased labor 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 the described increased investment in human capital even prior to naturalization (see Bratsberg et al. 2002, p. 573). At first, a random effects estimation was conducted.

²³ The EU foreigners include citizens of other associated states like the USA or Switzerland since these countries has signed association contracts with Germany alleviating the labor market access.

Table 6: Random effects 1975-2001

Dependent variable: $\ln w_i$	
Naturalized	0.0206* (0.0024)
Experience since naturalization	0.0034* (0.0004)
Prior naturalization	0.0007* (0.0001)
Control variables	education, labor market experience, occupation, occupational status, region, economic sector, nationality, year
Number of observations	507,325
Number of Groups	61,312
R ² overall	0.5775
within	0.6108
between	0.5775
Robust standard errors in parentheses	
* significant at 1% level	
rounded to 4 decimal place	
Source: own calculations with data of the IAB employment sample 1975-2001	

Table 6 shows that naturalization has an immediate positive effect on the wages of employees. Naturalization leads to a statistically significant 2.08% boost in wages. In addition to this, the estimation indicates that naturalized employees exhibit a rapid wage growth in the years after the naturalization event. Wage growth after naturalization is 0.34 percentage points higher per year. Reconsidering the fact that a foreign employee is by average 39 when he acquires the status of German citizenship (see table 2) reveals that the effect after the naturalization has a quite huge dimension. Both results are consistent with the argument that naturalization increases the labor market opportunities of immigrants in various ways. In contrast, employees seem to exhibit only marginal positive wage effects prior to the naturalization act.

In the following has to be tested whether the random effects estimation is the adequate approach. This can be done by the Hausman Test, which test for a correlation between the time-constant error term and the exogenous variables (see Wooldridge 2002, pp. 251-252). For this reason a fixed effects estimation was conducted. An advantage of the IAB sample is that it is feasible to include the education variable in a fixed effects estimation because the education of an employee could change over time.²⁴

²⁴ The education variable combines information about the highest school and professional graduation of an employee, which can change over time due to investment in human capital.

Table 7: Fixed effects 1975-2001

Dependent variable: $\ln w_i$	
Naturalized	0.0076* (0.0027)
Experience since naturalization	0.0029* (0.0004)
Prior naturalization	-0.0009* (0.0002)
Control variables	Education, labor market experience, occupation, occupational status, region, economic sector
Number of observations	507,325
Number of Groups	61,312
R ² overall	0.5120
within	0.6160
between	0.5011

Robust standard errors in parentheses

* significant at 1% level

rounded to 4. decimal place

Source: own calculations with data of the IAB employment sample 1975-2001

Table 7 shows that all coefficients of interest remain highly significant. While the size of the immediate effect is clearly smaller than the one in the random effects estimation the impact of citizenship acquisition during the following periods remains constant. Concerning the prior effect of naturalization the results indicate a small negative significant effect. Overall, the panel estimation has shown that despite controlling for individual heterogeneity the effect of naturalization remains highly significant and positive.

7 Conclusions

The analysis of the naturalization impact has shown that citizenship is an economically relevant factor in Germany. The descriptive analysis exhibits a sizable wage premium of naturalized immigrants, but indicates that this could be explained by educational differences between naturalized and non-naturalized immigrants. It has become obvious that especially high qualified foreigners tend to naturalized. The estimation of a pooled OLS reveals that the wage premium of naturalized foreigners can partly be explained by differences in sociodemographic characteristics. However, there remains a significant wage effect of naturalization. The effect has the largest size for the group of Third Country Nationals. This indicates that especially immigrant groups with strong regimentations on the German labor market profit by the naturalization act. Therefore, the removal of employment barriers on the labor market seems to be an important aspect of the naturalization impact.

The longitudinal analysis, which enables to control for processes of self-selection concerning unobservable characteristics within the foreign workforce, confirms that the possession of the German passport is an advantage on the German labor market. The analysis shows that naturalization has an immediate positive effect on the wages of employees and leads to a statistically significant boost in wages in the year of citizenship acquisition. In addition to this, the estimation indicates that naturalized employees exhibit a rapid wage growth in the years after the naturalization event.

The findings of the analysis have clear implications for the integration policy in Germany. Until now we had no empirical evidence for Germany about the economic implications of becoming a German. The analysis has shown that naturalization definitely affects the labor market outcomes of employees with a foreign background. Stakeholders, citizens and policy makers should discuss whether the wage premium of naturalizations is intended by our society. The classical argument would be that people without German passport should not be excluded from certain sectors of the labor market. Labor market access should be free for every individual legally residing in Germany irrespective of its passport. On the other hand it could be argued more provocatively that the incentives for foreigners to naturalize could be increased by enlarging the advantages of citizenship. This could be an alternative approach to foster the naturalization rates of foreigners in Germany, which are relatively low compared to other European countries. The other well known solution would be to relax the requirements for naturalizations or to promote the possibilities and advantages of naturalization within the foreign population.

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Appendix 1: Data set

Period: 1975-2001	Persons		Spells		Years of coverage		
	Frequency	Percent	Frequency	Percent	Min	Max	Average
Employees	61,312	100	507,325	100	1	27	15.3
Foreigners	54,612	89.07	426,069	83.98	1	“	15.0
Naturalized immigrants	6,700	10.93	81,256	16.02	2	“	16.8

Source: own calculations with data of the IAB employment sample 1975-2001

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