

Access to Citizenship and the Economic Assimilation of Immigrants

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Abstract

Immigrants in many countries have lower employment rates and earnings than natives. We analyze whether a more liberal citizenship policy improves the economic assimilation of immigrants in the host country. The empirical analysis relies on two reforms which created exogenous variation in the waiting time for citizenship across arrival year and birth cohorts. We find that faster access to citizenship improves the economic situation of immigrant women which is largely explained by a much stronger labor market attachment with higher employment rates, longer working hours and more stable jobs. Immigrants also invest more in host country-specific skills, especially vocational training and language ability. Overall, our results indicate that faster access to citizenship is a powerful policy instrument to boost economic integration in countries with traditionally restrictive citizenship policies.

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1 Introduction

Over recent decades, many developed countries have accumulated sizable immigrant populations. In 2013, the foreign-born made up 12% of the population in France, 13% in Germany, 17% in Sweden and almost 28% in Switzerland. These numbers are comparable to the share of foreign-born in traditional immigrant countries like Australia, Canada or the United States (OECD, 2015). At the same time, immigrants often seem to perform poorly in the labor market. They have higher unemployment rates and earn substantially less than natives (e.g. Algan et al., 2010; OECD, 2015); in Europe, they often seem to fall short along cultural or political integration as well (Algan et al., 2012).

This lack of social and economic integration poses substantial challenges for destination countries.¹ A disadvantaged economic position reduces the fiscal benefit of immigration to the destination country. Furthermore, economic exclusion might also threaten the social cohesion of host countries producing social unrest and hostility among the native population. These challenges are all the more pressing as many European countries, and Germany in particular, have accepted over a million Syrian and other refugees in 2015 alone. While immigrants seem to perform better in traditional immigration countries, the speed of assimilation as well as its underlying mechanisms are still hotly debated (see e.g. Abramitzky et al., 2012; Borjas, 2015; or Card, 2005 for recent contributions). As such, the current situation raises a number of important questions how immigrants may be better integrated into host societies. Which public policies are effective in promoting the economic assimilation of immigrants? Or, does successful integration hinge on the right “selection” of immigrants by the host country instead? Answers to these questions are crucial for the economic and social well-being of immigrants and destination countries alike.

Among the most important policies to foster immigrant assimilation is granting citizenship. While all developed countries offer the option to naturalize, they differ substantially in their eligibility requirements, in particular with respect to the number of years an immigrant has to reside in the destination country. At the one end of the spectrum, Canada allows some immigrants to naturalize after only four years of residency. On the other side, countries like Austria or Switzerland require 10 or even 12 years of residence. Little is known, however, whether facing longer or shorter waiting periods to apply for citizenship matter for economic assimilation. Answering this question is inherently difficult because countries not only impose different residency requirements but also vary along other dimensions that influence the choice of destination countries and immigrants’ economic well-being. Casual observation suggests, for instance, that residency requirements are shorter in traditional immigration countries which also have a lot of experience with large-scale migration and integration. Residency requirements do sometimes vary within a given

¹In this paper, we use the terms immigrant assimilation and integration interchangeably.

country for different groups of immigrants. Immigrants who are married to natives, for example, may naturalize faster than immigrants on a work or education visa. Yet, marrying a native is likely to speed up assimilation even independently of the residency requirement (see Meng and Gregory, 2005 for evidence).

To shed light on the labor market consequences of citizenship eligibility, we use variation in residency requirements induced by two reforms of citizenship law in Germany. Traditionally, Germany had a very restrictive citizenship law which was closely tied to ancestry and ethnic origin. In 1991, however, the government introduced for the first time explicit criteria how immigrants could obtain citizenship. And since 2000, all immigrants can naturalize after eight years of residency. The two reforms provide rare variation in the timing of eligibility for citizenship across arrival and birth cohorts. Specifically, the 1991 reform defined age-dependent residency requirements for naturalization. Older immigrants (arrival age 15 and above) faced a 15-year residency requirement before they could apply for citizenship. Younger immigrants (arrival ages between 8 and 14) in turn could apply for citizenship after only eight years in Germany. Child immigrants (arriving before the age of 8) in turn could naturalize when they turned 16. The timing of both reforms generates additional variation as some immigrants had to wait longer (if they arrived in Germany as a child in 1980, for instance) or shorter (if they arrived in Germany at age 15 in 1990, for example) than the usual 8 or 15 years respectively. Our estimation approach then compares the labor market performance of immigrants from the same arrival cohort who get eligible for citizenship in different years while controlling flexibly for year of birth, general assimilation, age and time effects. As long as eligibility and citizenship have permanent effects on labor market performance, outcomes for immigrants with faster access to citizenship should improve relative to immigrants who become eligible only much later.

Economic theory suggests a number of reasons why citizenship and the timing of eligibility could improve the situation of immigrants in the labor market. First, citizenship is required for a number of civil servant or public sector jobs. In some countries like Germany, these restrictions apply to a much wider range of occupations: prior to 2012, non-EU citizens had only restricted access to regulated professions like lawyers, notaries, pharmacists or physicians. More generally, citizenship removes any restrictions on career mobility that many immigrants faced until recently. Prior to 2005, for example, a temporary permit did not allow immigrants to be self-employed for the first 8 years; or switch occupations within the first three years. Citizenship now enables immigrants to work in any job, at any time and place, which should improve the match quality between workers and firms. To the extent that these jobs and newly attainable career options offer better pay or working conditions than jobs available to the average immigrant, naturalization improves the labor market prospects of immigrants. A second reason why access to citizenship is valuable in the labor market is that employers in the private sector might be less willing

to invest in a foreign employee who will (or is perceived to) leave the host country in the near future (see e.g. Lalonde and Topel, 1997). Through naturalization, the immigrant provides a signal of long-term commitment to remain in the destination country - and thus eliminates explicit or implicit barriers to training or career mobility within the firm.²

If match quality and training opportunities by employers are complements to worker skill, both factors should raise the returns to formal education. The faster an immigrant becomes eligible for citizenship, the longer the immigrant can reap these higher returns to skill. Hence, the incentives to invest in human capital should go up. Finally, there might be an important psychological motive of short waiting periods (see Hainmueller et al., 2016 for a similar argument with respect to asylum procedures). The option to naturalize signals the immigrant that he or she becomes a full member of the host society with all rights and responsibilities. As a result, an immigrant with faster access to citizenship might feel more welcome and more inclined to identify with the host country. As a result, the immigrant is more likely to follow the host country role model in terms of labor force attachment, the importance of education or the need to speak the host country language. In sum, changes in incentives on both the demand and especially the supply side of the labor market suggest that access to citizenship could be an important policy instrument to improve the economic assimilation of immigrants.

Our findings suggest that reduced residency requirements increase the number of immigrants naturalized. At the same time, we find evidence for positive selection into citizenship with respect to age and education. The reduced-form estimates suggest that shorter waiting periods for citizenship have few, if any effects on male employment and earnings. We document, however, sizable employment and earnings effects for women. Furthermore, we show that all of the improvements in labor market income for women comes from an increase in labor force attachment. Women are more likely to be employed, work more hours per week, are more likely to be employed full-time and have longer job tenure. Given the sizable wage penalties of part-time work and jobs with high turnover in most countries including Germany, changes in labor supply are one important channel for the large earnings changes among women. Men, in contrast, actually reduce their working hours slightly but also become more productive on the job. The higher productivity of men on the job is mirrored in better formal education, esp. vocational degrees, and improvements in German language skills - both in speaking and writing. While women also invest more in education and language skills, they invest less than men. Finally, we also document improvements in the jobs men and women hold: women are more likely to work in a white-collar job and have a permanent work contract; men are more likely to work in the public sector and are less likely to be self-employed.

²In addition, non-EU citizens, even with a permanent residency status, still require visa to travel into other EU countries. As such, employers might hesitate to hire a non-EU citizen for a job with extensive traveling or assignments abroad due to additional visa costs and reduced flexibility.

Overall then, reduced residency requirements improve the human capital base of immigrants, but also the labor force attachment and hence, the relative economic position of immigrant women. Reducing residency requirements might therefore be one promising tool to improve immigrant assimilation in countries with traditionally restrictive immigration policies.

This article contributes to three strands of the literature. First, we contribute to the literature on naturalization decisions (Chiswick and Miller, 2008; Mazzolari, 2009; and Yang, 1994 for the United States; De Voretz and Pivnenko, 2006 for Canada; Bevelander and Veenman, 2008 for the Netherlands; Constant et al., 2009 for Germany). Most importantly, our analysis is closely related to the literature on citizenship and labor market outcomes in North America and a few European countries. Most studies rely on cross-sectional data comparing naturalized citizens with other immigrants (e.g. Chiswick, 1978; De Voretz and Pivnenko, 2006 for North America; Bevelander and Veenman, 2008 for the Netherlands; Bevelander and Pendakur, 2011; and Scott, 2008 for Sweden; Fougère and Safi, 2009 for France). More recently, a few studies employ panel data to study the relationship between actual naturalization and labor market performance (Bratsberg et al., 2002; Bratsberg and Raaum, 2011; Steinhardt, 2012). All of these studies focus on the migrant’s decision and their consequences in the labor market while trying to address the selection into naturalization. Most recently, Hainmueller et al. (2015, 2017) have used local referendums on citizenship applications in Switzerland in a RDD design to analyze whether narrowly winning the citizenship referendum improves the political and social integration of immigrants.

We contribute to the naturalization literature in three important ways: first, we focus on the consequences of a more liberal citizenship policy by the host country - rather than the consequences of an immigrant’s decision to naturalize. Most importantly, we can shed light on the question whether liberalizing access to citizenship speeds up integration or rather delays it. Our results suggest that a liberal citizenship policy is an important catalyst for integration and hence, a powerful tool to advance the economic well-being of the immigrant population. Second, we can rely on arguably exogenous variation in eligibility rules from national immigration reforms for identification. Our study therefore does not face the kind of selection problems of earlier, especially cross-sectional studies. Finally, we provide evidence on the benefits of citizenship in a country where naturalization is the exception rather than the norm.³ Returns to citizenship might differ from those in traditional immigration countries or countries with a long immigration history, such as the US or the UK. Taste-based discrimination, for example, might be more widespread in a country where the native population is more homogeneous and shares common values or a

³A related study by Avitabile et al. (2013) analyzes how citizenship by birth for second-generation immigrants affects the assimilation of their parents in Germany. Our analysis differs along at least three dimensions: we focus on first-generation immigrants who themselves get access to citizenship; second, we analyze the consequences of a different policy instrument, the length of the waiting period to citizenship. Finally, we focus on immigrants’ economic assimilation in the labor market.

common religion. Returns to citizenship would then be higher if naturalization eliminates taste-based discrimination in the host country; yet, returns might be lower if discrimination is based on foreign-sounding names or appearance rather than citizenship status alone.⁴

Finally, our study also contributes to the literature on immigrant assimilation. Most of the literature compares labor market outcomes between natives and immigrants documenting substantial wage gaps upon arrival. While the literature agrees there is some catch-up with time in the host country, extent and speed of immigrant assimilation is still hotly debated (see e.g. Abramitzky et al., 2012; Borjas, 1985, 2015; Card, 2005; Hu, 2000; Lalonde and Topel, 1997; Lubotsky, 2007; see Duleep, 2015 for a survey). For Germany, most studies do not find much evidence for assimilation to natives (Pischke, 1993; Dustmann, 1993; Licht and Steiner, 1994; Schmidt, 1997; results in Fertig and Schurer, 2007 are mixed). We focus instead on the assimilation between subsequent immigrant cohorts which share many characteristics and hence are more comparable with each other than with the native population (see also Lalonde and Topel, 1997). More importantly, we can identify whether faster access to citizenship speeds up economic assimilation. As such, our analysis has direct implications for policy-makers whose goal it is to improve immigrant assimilation in their countries. Finally, we also provide novel evidence on several potential mechanisms of assimilation: labor force attachment, economic self-sufficiency, improvements in education and language skills as well as changes in job characteristics.

This article proceeds as follows. The next section discusses the recent immigration reforms in Germany. Section 3 introduces our data sources, while Section 4 explains our empirical strategy. Section 5 discusses the results on naturalization decisions, labor market performance and economic self-sufficiency; it also sheds light on the underlying mechanisms. Section 6 presents a number of informal validity checks to test the robustness of our results. Section 7 discusses the policy implications of our findings and concludes.

2 Institutional Background

2.1 A Reluctant Immigration Country

More than ten million - or about 13% of the population - in Germany is foreign-born. After World War II, most immigrants, especially those from Turkey, Yugoslavia or Italy, came to Germany as guest workers. From the late 1950s until the guest worker program was abolished in 1973, the German government actively recruited foreign, mostly low-skilled labor through a series of bilateral agreements, in order to meet the

⁴Evidence from the European Social Survey suggests that naturalized immigrants feel much less discriminated in Germany than non-naturalized immigrants (OECD, 2011, Figure 8.1). At the same time, a recent field experiment for apprenticeships in Germany shows that there is some discrimination against immigrants based on foreign-sounding names or foreign accents which are largely independent of citizenship status (Kaas and Manger, 2012). As such, it is a-priori unclear whether discrimination increases or reduces the returns to citizenship compared to traditional immigration countries.

growing demand of Germany’s booming manufacturing sector. The guest worker program was originally intended as a short- to medium-run policy. Guest workers initially obtained work and residence permits for one year. The regulations after that depended on the country of origin. For Turkish guest workers, for instance, the work permit was tied to a particular employer and occupation for the first years. After three years, the guest worker could apply for other jobs within the same occupation. Full job mobility was granted only after four years of gainful employment in Germany.⁵ Furthermore, temporary work permits are subject to restrictions on the job and mobility as well as subject to a proof of precedence which requires that no German or EU employee is available for the job. Permanent work permits with fewer restrictions may only be obtained after 4 years of gainful employment and 6 (before 2005) or 5 (since 2005) years of residence.

The temporary nature of the guest worker program notwithstanding, many guest workers actually stayed and settled down in Germany. Since the late 1980s and especially after the fall of the Berlin Wall, new waves of immigrants arrived in Germany from Eastern Europe and the former Soviet Union. In the early 1990s, around one million foreigners (about 1% of its population) arrived in Germany each year.⁶ These immigration rates are comparable to those in the United States during the age of mass migration.

Despite substantial inflows of foreign-born, Germany had no explicit naturalization policy at the time. Prior to 1991, German citizenship was closely tied to ancestry (*jus sanguinis*) as laid down in the law of 1913. Explicit criteria how a foreign-born immigrant without German ancestry would qualify for naturalization did not exist. The official doctrine was that foreigners were only temporary residents in Germany - even though many foreigners had lived in the country for many years. The Federal Naturalization Guidelines of 1977 summarize the official view at the time quite well: “The Federal Republic of Germany is not a country of immigration; it does not strive to increase the number of German citizens by way of naturalization [...]. The granting of German citizenship can only be considered if a public interest in the naturalization exists; the personal desires and economic interests of the applicant cannot be decisive.” (Hailbronner and Renner, 1992, pp. 865-6).

2.2 A New Approach to Citizenship

The passage of the Alien Act (*Ausländergesetz (AuslG)*) by the federal parliament on April 26, 1990 (and the upper house on May 5, 1990) marked a turning point in Germany’s approach to immigration and

⁵Regulations for guest workers from North Africa, Yugoslavia and many other countries in Africa were more restrictive than for Turkish guest workers. Guest workers from the European Union (resp. its predecessor) did not require a work permit and hence, were not restricted to work for a specific employer, for example.

⁶Many of these were ethnic Germans (i.e. immigrants with some German ancestry), mostly from Eastern Europe and the former Soviet Union, who had access to citizenship within three years of arrival in Germany. Below, we drop ethnic Germans from our sample as they are not affected by the immigration reforms we study.

citizenship. The reform which came into effect on January 1, 1991 defined, for the first time, explicit rules and criteria for naturalization. Most importantly, the new law imposed age-dependent residency requirements for citizenship. Adult immigrants could naturalize after 15 years of residency in Germany. They were two exceptions to the general rule: immigrants who arrived in Germany before the age of 8 could naturalize when they turned 16. And immigrants who arrived in Germany when they were between 8 and 14 years-old could naturalize after 8 years of residency.⁷ These residency requirements are still quite restrictive in comparison to traditional immigration countries: Immigrants may naturalize in Canada after four years and after five years in the United States and the UK. Yet, they are comparable to countries like Sweden, Austria or Switzerland, for instance, where residency requirements are 9, 10 and 12 years respectively.

Applicants for German citizenship had to fulfill several other criteria: first, they had to renounce their previous citizenship upon naturalization as the new law did not allow dual citizenship. Citizens of the European Union were exempt from this rule and could keep their original citizenship.⁸ Second, the applicant must not be convicted of a criminal offense.⁹ Older immigrants who arrived in Germany at age 15 or older had to demonstrate economic self-sufficiency, i.e. they should be able to support themselves and their dependents without welfare benefits or unemployment assistance. Younger immigrants who arrived in Germany before the age of 15 had to have completed a minimum of six years of schooling in Germany, of which at least four years had to be general education. It is important to stress that both requirements are less restrictive than the requirements for obtaining a permanent work or residence permit. Finally, an applicant needed to declare her loyalty to the democratic principles of the German constitution. Spouses and dependent children of the applicant could be included in the application for naturalization even if they did not fulfill the criteria individually.¹⁰

The age-dependent residency requirements remained in place until the second important reform came

⁷See § 85+86 AusIG (Alien Act). If the applicant stayed abroad for no more than 6 months, the period of absence still counted toward the residency requirement. Temporary stays abroad (between 6 months and 1 year) may still count for the residency requirement.

⁸Children of bi-national marriages, for example, did not have to give up their dual citizenship until they turned 18. Exceptions were also granted if the country of origin prohibits the renunciation of citizenship or delayed it for reasons outside the power of the applicant, if the applicant was an acknowledged refugee or if the renunciation imposed special hardships on older applicants. In practice, few exceptions to the general rule were granted in the 1990s.

⁹Applicants with minor convictions, such as a suspended prison sentence up to 6 months (which would be abated at the end of the probation period), a fine not exceeding 180 days of income (calculated according to the net personal income of the individual), or corrective methods imposed by juvenile courts, were still eligible. Convictions exceeding these limits were considered on a case-by-case basis by the authorities.

¹⁰Very similar criteria apply in other countries. Overall, they seem to play a secondary role for the naturalization process. A survey of eligible immigrants by the Federal Office of Migration and Refugees showed that most migrants had good knowledge about the naturalization criteria. Of those, 72% reported that they fulfilled all requirements while 23% reported to meet most, though not all of the criteria (BAMF, 2012). As most of the additional criteria have to be fulfilled in order to obtain a work permit, it is unlikely that many applications for naturalization would be denied because of these other criteria. If anything, this would bias our estimates downward as we would define an immigrant as eligible (based on the residency requirement) even though she is not (based on one of the other eligibility criteria).

into effect on January 1, 2000. The Citizenship Act (*Staatsangehörigkeitsgesetz (StAG)*) reduced the residency requirement to eight years irrespective of the immigrant’s age of arrival.¹¹ The other requirements of the 1991 reform stayed the same: applicants could not have a criminal record, had to demonstrate economic self-sufficiency and their loyalty to democratic principles. In addition, the new law also required applicants to demonstrate adequate German language skills prior to naturalization. As before, the law of 2000 did not recognize dual citizenship in general though exemptions became more common.¹² The 2000 reform further introduced elements of citizenship by birthplace into German law. A child born to foreign parents after January 1, 2000 was eligible for citizenship if one parent had been a legal resident for 8 years and had a permanent residence permit for at least three years. As our analysis focuses on first-generation immigrants, our sample is not directly affected by these *jus soli* provisions.¹³

The liberalization of citizenship law after 1991 and again after 2000 is reflected in the number of naturalizations in Germany as shown in Figure 1. Prior to the first reform, less than 20,000 persons became naturalized on average each year. After the immigration reform in 1991, naturalizations increase to 80,000 per year during the 1990s. After the second reform in 2000, the number of naturalizations jumps to over 180,000 and then gradually declines, but remains above 100,000 per year. Relative to the stock of immigrants, the annual propensity to naturalize was below 0.4% prior to 1991 and increased to 2% after 1991. Yet, the propensity to naturalize in Germany remains low in international comparison: by 2007, only about 35-40% of first-generation immigrants with more than ten years of residency had naturalized; the share is about 60% in the United Kingdom and over 80% in Canada (OECD, 2011).

The citizenship reforms were brought on the agenda by the fall of the Iron curtain and demographic changes on the one hand; and political and court decisions on the other hand.¹⁴ Germany’s reliance on *jus sanguinis* was in part motivated by the idea to extend citizenship to East Germans in the GDR and ethnic Germans scattered around the Eastern Bloc after World War II. With unification, when all East Germans automatically obtained the new German passport, this concern was increasingly obsolete. At the same time, the demographic composition of Germany’s population had changed dramatically: while

¹¹The law was adopted with a large majority in the lower house on May 7, 1999 and the upper house on May 21, 1999. The provisions are laid down in § 10 Abs. 1 StAG (Abs. 2 for spouses and dependent children of eligible immigrants) which forms the legal basis for 70-80% of all naturalizations in Germany (BAMF, 2008).

¹²It became easier for older applicants and refugees to keep their previous citizenship. Applicants could also keep their nationality if it was legally impossible to renounce it or if it imposed a special hardship like excessive costs or serious economic disadvantages (e.g. problems with inheritances or property in their country of origin).

¹³See Avitabile et al. (2013) for an analysis of the *jus soli* provisions of the 2000 reform. There might be an indirect effect on first-generation immigrants, however. Before the 2000 reform, second or third generation immigrants could only become naturalized if their parents applied for citizenship. After the 2000 reform, young children had access to German citizenship independently of their parents’ decision (subject to the residency requirements outlined above). Hence, the reform of 2000 might have actually decreased the inter-generational benefits of citizenship for foreign parents with young children. We return to this issue in the robustness analysis below.

¹⁴While several reform attempts were made during the 1980s, mostly from left-wing parties, all of them were defeated by the political opposition or influential social groups.

in 1960, only 700,000 foreigners lived in Germany, the number had soared to over 7 million in the 1980s.¹⁵ Given the sizable foreign-born population with no political decision rights, several large cities wanted to allow foreigners to vote in local elections. The Federal Constitutional Court ruled these initiatives unconstitutional in 1990 on the grounds that the basic principle of popular sovereignty could only be executed by Germany's citizens; at the same time, the Court mandated that a change in citizenship law was required to allow the permanent immigrant population to naturalize (see Howard, 2008 for a more detailed discussion). The final push for the 2000 reform was the 1998 general election that brought to power a coalition of Social Democrats and Greens that have traditionally been favorable to granting political rights to foreigners. This discussion highlights that concerns about the actual or perceived lack of economic integration were not a motivation for the reforms as foreigners were still viewed at that time as temporary residents. It is only after the first and especially the second reform that the question of integration or the lack thereof became a public and political concern in Germany.

3 Data Sources

3.1 Microcensus

The main data set to study the consequences of naturalization in the labor market is the Microcensus, an annual survey of 1% of the German population. It covers detailed questions about individual socio-demographic characteristics, employment, personal income and household composition. Most importantly for our purpose, the Microcensus has large samples of immigrants (about 50,000 per year) and precise information on their year of arrival. We use the survey years from 2005 to 2010 for our analysis for two reasons. The first reason is that detailed information on naturalization decisions has only been available since 2005.¹⁶ The second reason for the more recent time period is that immigrants in our sample arrived in Germany as children or teens - the mean age of arrival in our sample is 12 years. As such, they are often still in full-time education or training when they first become eligible for citizenship.¹⁷ By focusing on the 2005-2010 period, we can study whether faster access to citizenship as a teen or youth improves the labor market careers of immigrant adults.

The sample is restricted to first-generation immigrants, i.e. immigrants born outside of Germany. Our

¹⁵In the 1990s, the stark contrast between second- and third-generation immigrants who were born and educated in Germany (but could not naturalize) and ethnic Germans from Eastern Europe or the Former Soviet Union who often had few German language skills or connections to Germany (who could naturalize), underlined the notion that Germany's citizenship policy was outdated.

¹⁶This detailed information is not available in the Socio-Economic Panel (SOEP) or the social security data from the IAB, two other popular data sources.

¹⁷In Germany, compulsory schooling is between 9 and 10 years depending on the state of residence. Children typically enter at the age of six which implies that students can leave school when they are between 15 and 16 years old.

sample consists of both economic migrants, which came to Germany through the guest worker program or as part of family reunion, and refugees who were given political asylum in Germany. We drop ethnic Germans who have access to German citizenship within three years of arrival and are therefore not affected by the reforms we analyze.¹⁸ Furthermore, we focus in our analysis on immigrants who arrived in Germany between 1975 and 2002 and become eligible for citizenship some time between 1991 and 2010. To make the sample even more homogeneous, we further restrict the sample to immigrants who arrived before the age of 23 in Germany.

Our main outcome variables of interest are log personal income and employment. Personal income per month combines labor earnings, income from self-employment, rental income, public and private pensions as well as public transfers (like welfare or unemployment benefits, child benefits or housing subsidies) but is net of taxes and other contributions. To study assimilation in labor income (rather than other income sources), we focus on those employed (including students and others with some income-generating activity) at the time of the survey. We deflate personal income with the national consumer price index to 2005 prices. Employment is an indicator equal to one if the immigrant pursues any income-generating activity in the week before the interview and zero otherwise. We also analyze economic self-sufficiency or whether an immigrant receives social transfers. The main variable is coded as one if an individual receives any social assistance, either unemployment or welfare benefits; and zero otherwise.

We further seek to shed light on several potential mechanisms of assimilation: specifically, we analyze labor supply, investments in formal education and the type of job immigrants hold. To study labor supply behavior, we analyze normal working time (measured in hours per week) and whether the person works full-time (more than 30 hours per week). For educational investments, we distinguish between low-skilled (no high school or vocational degree), medium-skilled (a high school or vocational degree) and high-skilled immigrants (with a college degree). We also code whether an individual still attends school or works as an apprentice (and hence, attends vocational school). We characterize the type of job held through the following variables: whether an individual works on a temporary or permanent contract, whether she is self-employed or employed in the public sector. Finally, we study whether the immigrant is employed in a white-collar job which is defined as working as a clerk or officer, judge or civil servant. The variable is zero if someone is employed as a blue-collar worker or home worker.

The main control variables are birth year, year of arrival and the number of years in Germany. To control for heterogeneity across countries of origins in labor market outcomes, we classify immigrants into ten regions of origin: the traditional EU-15 member states (e.g. Italy or Portugal), immigrants

¹⁸We define ethnic Germans as individuals born outside Germany who naturalized within three years of arrival in Germany (which is legally impossible for regular immigrants) and whose previous nationality was Czech, Hungarian, Kazakh, Polish, Romanian, Russian, Slovakian or Ukrainian (see Birkner, 2007: Algan et al., 2010 follow the same approach).

from countries that recently joined the European Union (the EU-12, e.g. Poland or the Czech Republic), immigrants from Turkey, ex-Yugoslavia (except Slovenia) and the Former Soviet Union (except the Baltic states). We lump together other immigrants into broad regions of origin (Asia, Africa, the Middle East and North or South America). To test for heterogeneity across countries of origin, we use data on GDP per capita in the country of origin in 2005 from the Penn World Tables (Heston et al., 2011). Table A1 shows summary statistics of our sample of first-generation immigrants in the Microcensus. The share of naturalized immigrants in our sample is with 38% very similar to the aggregate naturalization rates of 35-40% for Germany reported by the OECD (OECD, 2015). The summary statistics demonstrates that our sample is young (around 30 years old) and has lived in Germany for almost two decades. Further details on the definition of each variable are contained in the data appendix.

3.2 Socio-Economic Panel

To study additional outcomes and run several robustness checks, we use the Socio-Economic Panel from 1984 to 2009 (SOEP, 2010). The SOEP is an annual panel interviewing more than 20,000 individuals about their labor supply, income and demographic characteristics. However, the number of immigrants is much smaller than in the Microcensus.¹⁹ The sample again consists of all first-generation immigrants who arrived in Germany between 1975 and 2002 and were under the age of 23 upon arrival.

Our main dependent variables are self-reported language skills in writing or speaking German which range from 0 (not at all) to 4 (very well). We recode these into two binary indicators equal to one if a person reports speaking (writing) the language well or very well. The variables are zero if a person reports no or bad skills in speaking (writing) in German. For the robustness checks, we further analyze log of monthly gross labor earnings (deflated with the national consumer price index) and labor force participation which is equal to one if an immigrant works in any type of employment; the indicator is zero if she is unemployed or out of the labor force. Our main control variables are again year of arrival, year of birth and the number of years spent in Germany. As in the Microcensus, we classify immigrants into ten broad regions of origin. Table A2 shows summary statistics for our sample of first-generation immigrants in the SOEP.

¹⁹Wagner et al. (2007) provide a comprehensive description of the data set. While the SOEP like the Microcensus contain guest workers and their families as well as refugees, the distribution of immigrants is different from the Microcensus because the SOEP oversampled immigrants in 1984 and 1994/5.

4 Empirical Strategy

4.1 Variation in Eligibility Induced by the Immigration Reforms

We now discuss how the immigration reforms described in Section 2 identify the effects of citizenship eligibility in the labor market. The key insight here is that the 1991 and 2000 reforms create variation in the timing of eligibility depending on an immigrant's arrival year and year of birth. Specifically, we have three groups of immigrants facing different residency requirements. Table 1 shows for each group the residency requirement imposed by the reform, the ages of arrival for eligibility and at which age they get eligible for citizenship. The first group which we call child immigrants, arrive in Germany before the age of 8. They become eligible when they turn 16 - or after between 9 and 16 years in Germany. The second group are young immigrants who arrive in Germany when they are between 8 and 14 years-old; they become eligible after 8 years in Germany. The final group are older immigrants who arrive between the ages of 15 and 22 and get eligible after 15 years (after 1991) or 8 years (after 2000).

There is additional variation in the residency requirements for all three groups because of the timing of the reforms. Child and young immigrants who arrived in Germany between 1976 and 1982, for instance, have to wait until 1991 before they can naturalize. As a result, they have to wait longer than age 16 or 8 years before they can naturalize. Similarly, older immigrants who arrived in Germany between 1986 and 1991 actually face shorter residency requirements than they expected: rather than 15 years, they only have to wait between 9 and 14 years. We will exploit this surprise component of the reforms below to support our findings that we identify a causal effect of eligibility.

Our empirical strategy then uses the variation in waiting times for citizenship eligibility that different immigrants face. Our treatment variable, the residency requirement for eligibility, varies from 8 to 16 years (see Figure 2 for the distribution among men and women in our sample).²⁰ It is equal to 8 years if an immigrant arrived in Germany between the ages of 8 and 14 in the 1991-2010 period; or if an immigrant who arrived in Germany after 1991 between the ages of 15 and 22. The variable is equal to 15 years if an older immigrant (arriving between the ages of 15 and 22) arrived in prior to 1986. The variable lies between 9 and 16 years for three groups of immigrants: all arrivals between 1976 and 1983 because they can only naturalize in 1991; older immigrants arriving between 1986 and 1991 as they can naturalize after the second reform in 2000; and child immigrants (who arrive in Germany before the age of 8) as they can naturalize only after they turned 16. We next discuss our estimation strategy.

²⁰Hence, our key independent variable has a limited range of years of residency requirements we can analyze. Nevertheless, we think that the range is informative for many countries in Europe with comparatively restrictive citizenship laws.

4.2 Eligibility and the Decision to Naturalize

To investigate how the residency requirement affects the decision to naturalize, we estimate the following model

$$Nat_{iabt} = \beta Elig_{ab} + \lambda D(B_b) + \mu D(Coh_a) + \vartheta_t + \gamma_1 YSM_{at} + \gamma_2 YSM_{at}^2 + \pi_1 Age_{bt} + \pi_2 Age_{bt}^2 + \delta' X_{it} + \varepsilon_{iabt} \quad (1)$$

where the dependent variable Nat_{iabt} is an indicator equal to one if individual i (born in year b and arrived in year a) is naturalized in year t and zero otherwise. Alternatively, we use the years since a naturalized immigrant has obtained citizenship as dependent variable. The main independent variable is the residency requirement ($Elig_{ab}$) which captures the number of years an individual has to wait before becoming eligible for citizenship. The residency requirement is derived from the eligibility rules discussed in the previous section and varies by year of birth and arrival year. Our main parameter of interest is β which measures how a longer waiting period affects the decision to naturalize.

Equation (1) controls for cohort of arrival fixed effects $D(Coh_a)$ to adjust for changes in the quality of immigrants arriving in Germany over time. We further include year of birth fixed effects $D(B_b)$ to control for differences in naturalization decisions across birth cohorts as well as year fixed effects ϑ_t to adjust for aggregate changes in the propensity to naturalize over time. We also would like to control for general assimilation effects and for age effects. Here, we face two well-known adding-up constraints: year of arrival plus years in Germany as well as year of birth plus age are both equal to the current calendar year. We can therefore not include a full set of fixed effects for years in Germany or age. In our main specification, we include a second-order polynomial of years since migration (YSM_{at}, YSM_{at}^2) and age (Age_{bt}, Age_{bt}^2). Additional controls X_{it} include the immigrant's gender and region of origin fixed effects to allow naturalization propensities to differ for men and women and across source countries. We further include state fixed effects and state-specific linear trends to capture differences in the numbers of naturalizations across regions of residence and changes therein over time.²¹ Finally, we cluster the standard errors by age x arrival year to adjust for the level of aggregation in the treatment variable.

It is important to note that the residency requirement is but one, albeit important factor for naturalization decisions. Other eligibility criteria, like the absence of a criminal record, for instance, also matter for the successful application to citizenship. Since we do not have any information whether our sample satisfies these other criteria, some immigrants will satisfy the residency requirement but fail to qualify for

²¹Instead of region of origin fixed effects, we could include detailed controls for the source countries instead (as in Chiswick and Miller, 2008, for example). We might expect, for example, that the political or economic circumstances in the country of origin might also play a role for naturalization decisions. As we are mostly interested in the labor market returns of eligibility, we choose a more reduced form approach here.

other reasons. As long as the likelihood of failing one of the other criteria is uncorrelated with the waiting period, our estimates will be unbiased though less precisely estimated.

4.3 Eligibility and Labor Market Performance

To identify how residency requirements affect the labor market performance of immigrants, we estimate variants of the following model:

$$Y_{iabt} = \tilde{\beta}Elig_{ab} + \tilde{\lambda}D(B_b) + \tilde{\mu}D(Coh_a) + \tilde{\vartheta}_t + \tilde{\gamma}_1 YSM_{at} + \tilde{\gamma}_2 YSM_{at}^2 + \tilde{\pi}_1 Age_{bt} + \tilde{\pi}_2 Age_{bt}^2 + \tilde{\delta}'X_{it} + \tilde{\varepsilon}_{iabt} \quad (2)$$

where Y_{iabt} is a labor market outcome of immigrant i from birth cohort b who arrived in Germany in year a in year t . The main independent variable is again the residency requirement ($Elig_{ab}$) which captures how the waiting period for citizenship affects labor market careers. As before, we control for a full set of year of arrival, birth cohort and year fixed effects. As in the previous section, we include second-order polynomials in years in Germany and age to control for general assimilation and age effects in the labor market.²² We demonstrate in Section 5.3 that our estimates are unchanged if we allow for even more flexible specifications in years since migration or age. We again include region of origin fixed effects, state of residence fixed effects and state-specific trends.

The parameter of interest $\tilde{\beta}$ in equation (2) measures whether a longer waiting period reduces employment or wages. Conditional on year of arrival, year of birth, year fixed effects and other controls, the parameter is identified from the interaction between year of arrival and year of birth. As discussed in Section 4.1, the variation comes from differences in residency requirement faced by younger and older immigrants who arrive in Germany in the same year. The identifying assumption is that labor market outcomes have the same non-parametric year of birth pattern for subsequent arrival cohorts conditional on our control variables. This assumption would be violated, for example, if younger birth cohorts earned more than older birth cohorts among recent immigrants, while the opposite pattern is observed for those same birth cohorts among earlier arrival cohorts. As we show below, allowing for even more flexible dependencies between birth and arrival cohorts, however, does not affect our results.

Another potential concern for our identification strategy is age of arrival effects. Immigrants who arrived at younger ages, for instance, invest more in host-specific human capital like language skills and might therefore perform better in the labor market even independently of citizenship. It is important to

²²Note that our approach to allow for assimilation effects differs from most studies in the assimilation literature where labor market outcomes for immigrants and natives are related to cohort of arrival, years since migration and year fixed effects. To break the perfect multicollinearity between year of arrival, years since migration and current year, the year effects in this literature are often restricted to be the same for natives and immigrants. As we are interested in the returns to citizenship, we pursue a different approach here.

point out, however, that there is no linear relationship between age of arrival and the waiting period. As Table 1 shows, child immigrants have to wait longer than young immigrants who in turn face a shorter waiting period than older immigrants. In addition, controlling for age of arrival does not really affect our results. We address these concerns after presenting our main results (in Section 5.3). A final issue in studies like ours is selective in- or out-migration of immigrants. If return migrants, for instance, are negatively selected from the pool of immigrants in the host country, return migration overestimates general assimilation effects. This well-known bias from selective return migration does not affect our estimates as long as the selection into return migration is uncorrelated with the waiting period for citizenship. We discuss and test for the influence of selective in- and out-migration in the robustness analysis (in Section 6.1). All additional tests suggest that these threats to identification do not appear to be a major concern for our study.

5 Empirical Results

5.1 The Decision to Naturalize in Germany

We start out with examining the relationship between the residency requirement for citizenship and actual naturalization decisions. This first-stage relationship is not only interesting in its own right but also helps to interpret the effects of faster eligibility on labor market outcomes. If most immigrants never naturalize or mostly naturalize through other channels, such as marrying a German native, for instance, eligibility after the 1991 and 2000 reforms should have few effects on labor market outcomes.

Table 1 shows the results of estimating equation (1) where the dependent variable is whether an immigrant is naturalized or not. The results show that a longer waiting period to citizenship reduces the propensity to naturalize (see column (1)). To evaluate the size of the effect, we use the 7 years difference between the reduced waiting period of 8 years and the regular residency requirement of 15 years that was in place after the 1991 reform. An immigrant who gets eligible after 8 years has then a 9 percentage points (7×0.013) higher propensity to naturalize in Germany than an immigrant with a 15-year residency requirement. Compared to the overall naturalization rate, the longer waiting period thus implies a sizable decline of 25% ($-0.091/0.38$) in the share naturalized.

Column (1) further shows some interesting selection patterns into Germany citizenship. Immigrants in our sample are more likely to naturalize the longer they have resided in Germany and the older they are, even conditional on years since immigration. The age pattern is in line with studies from traditional immigration countries (Chiswick and Miller, 2008 for the United States; De Voretz and Pivnenko, 2006 for Canada). Column (2) also controls for formal education. Medium- and high-skilled immigrants are more

likely to naturalize than low-skilled immigrants and those still attending general or vocational school. The propensity to naturalize is highest among high-skilled men. The skill pattern is also in line with evidence from other countries which typically report positive selection into citizenship (see Chiswick and Miller, 2008 and Yang, 1994 for the US; or Fougère and Safi, 2009 for France). At the same time, the correlation between the waiting period and naturalization decisions is unaffected by the inclusion of controls for education indicating that longer waiting periods are likely to affect all skill groups similarly. It is important to stress that the relationship between education and naturalization should not be interpreted as causal. Our immigrant sample came to Germany when they were between 0 and 22 years of age; therefore many immigrants made their educational investments in Germany which might have been influenced by the option to naturalize. We return to this question in Section 5.4 below.

The evidence thus far shows that longer waiting periods reduce the take-up of citizenship which is one explanation why the naturalization rates in Germany are much lower than in traditional immigration countries like Canada, for example. Columns (3) and (4) further investigate whether longer waiting periods also affect the timing of naturalization. The sample is now restricted to naturalized immigrants; the dependent variable is the years since an immigrant naturalized. The estimates in column (3) show that, conditional on naturalization, the timing of naturalization is not affected by the waiting period. Again, these results are not much changed if we control for education as well (see column (4)). In sum, longer residency requirements reduce the take-up of citizenship which suggests that a longer waiting period reduces the motivation on the immigrant side, for example, by making them feel less welcome in the host society. Furthermore, as residency requirements affect naturalization decisions, we would expect them to have an impact on the assimilation of immigrants in the labor market as well.

5.2 Labor Market Performance

We now turn to our main question whether faster access to citizenship has any effects on employment and labor market income. Because immigrant men and women differ in their labor force attachment, wages and type of occupation chosen (see Table A1), we estimate all labor market outcomes separately by gender. As a benchmark, we start with OLS estimates where the key independent variable is whether an immigrant has naturalized and all other variables are defined as in equation (2). Our main focus is, however, on the reduced-form specification which shows whether faster access to citizenship improves the labor market outcomes of immigrants. Knowing the returns to faster eligibility is important as it represents the option value of naturalization to immigrants. It is also the primary parameter of interest for policy makers who could shorten or lengthen the residency requirement to encourage naturalization and assimilation.

The OLS results (in columns (1)-(2) for men and columns (5)-(6) for women) in Table 3 suggest

that naturalization is associated with higher employment rates, by about 4.4 percentage points for men and 5.8 percentage points for women. In addition, naturalization is associated with higher labor market income by 0.062 log points for men and 0.124 log points for women. However, the correlation between actual naturalization and labor market outcomes may be misleading. As naturalized migrants are not selected randomly from the immigrant population, it is difficult to separate the return to citizenship from the selection into naturalization. Migrants applying for citizenship might well be those with the highest motivation to integrate and the best prerequisites to perform well in the host country.

To net out these selection effects, columns (3)-(4) and (7)-(8) of Table 3 show the intent-to-treat effect of residency requirements on labor market performance. Interestingly, shorter waiting periods for citizenship make little difference for men: both employment and labor market income are unaffected (columns (3)-(4)). For women, we find that shorter residency requirements increase employment by 0.8% (column (7)). There are also sizable earnings effects by about 0.016 log points per year (column (8)).²³ These estimates indicate that faster access to citizenship carries substantial benefits for immigrant women. Evaluated at the 7 years difference in residency requirements, female employment is 5.6 percentage points and their labor market income 0.112 log points higher.²⁴

To put these estimates into perspective, we compare the returns to faster eligibility to the earnings gains from general assimilation. The estimates in column (8) suggest that earnings rise by 0.041 log points per additional year in Germany. While these estimates are substantial, it should be kept in mind that we study a relatively young sample for which earnings growth is most pronounced. Furthermore, we do not control for formal education which is likely to be endogenous to the option to naturalize. As such, the general assimilation profile also contains skill premiums and their evolution over the life-cycle. Comparing the returns of shorter residency requirements and general assimilation shows that a reduction in the residency requirement by one year is equivalent to 2/5 of the annual assimilation effect for women, which seems reasonable. We can use our estimates to provide some back-of-the-envelope calculation on the boost to assimilation: facing an 8-year rather than a 15-year residency requirement raises earnings by 0.112 log points. At the same time, earnings raise with each year in Germany by 0.041 log points. Hence, an immigrant with the shorter residency requirement would achieve the same earnings gains relative to

²³Given that employment increases for immigrant women, the question arises whether compositional changes might explain the large income gains for women. To address this question, we estimate a selection model. Finding a suitable exclusion restriction for the participation margin is challenging; here, we use the number of persons present in the household. The results show that wage gains are similar if we control for changes along the participation margin. The selection model further indicates that women entering the labor market are those with lower earnings potential (not reported).

²⁴One might wonder whether the linear specification is appropriate: when we include higher-order terms of the waiting period, we fail to find evidence for nonlinearities. In addition, we also split the waiting period into binary variables with the cutoff at 8 years, 10 years or 12 years. At all margins, we find that immigrant women facing the shorter residency requirements have higher employment and earnings (not reported).

natives almost 3 years earlier than an immigrant with the longer waiting period (0.112/0.041).

We also investigate whether faster eligibility is related to economic self-sufficiency. The dependent variable is now an indicator equal to one if an immigrant receives unemployment benefits or welfare benefits in the current year and zero otherwise; the specification is otherwise the same as in equation (2). Note that immigrants can claim both benefits irrespective of their citizenship status as long as they hold a valid work permit.²⁵ While an immigrant has to demonstrate economic self-sufficiency to obtain a temporary work permit, this is no longer required once an immigrant has a permanent work permit (after at least five years in the country). The correlation between actual naturalization and receiving any social assistance in the top panel of Table 4 (see column (1) for men and column (3) for women) suggests that naturalized immigrants are actually less likely to receive any social benefits. In the bottom panel of Table 4, we further check whether immigrants who receive some social assistance are more likely to draw welfare benefits; or whether they receive unemployment benefits instead. The latter are only paid to individuals who have been attached to the labor market, while the former are independent of the person's work history. The estimates show that naturalized men and women are less likely to draw welfare benefits. Hence, naturalized immigrants not only perform better in the labor market but also require less assistance from the government.

Turning to the effects of faster eligibility (shown in column (2) for men and column (4) for women), we find no significant effect on the overall propensity to draw social assistance (top panel) or welfare benefits in particular (bottom panel). Among men, faster access to citizenship seems to have few benefits in the labor market but at the same time does not increase welfare dependency. For women, we find that faster access to citizenship increases both employment and earnings; yet, we do not find any decline in social benefit receipt. This result is less surprising given that not only the employment rate of immigrant women is low (only about 50% in our young sample, see Table A1), but also that few immigrant women draw social benefits (only 10.6%). The large gap is likely explained by the traditional family structure among immigrants: female immigrants in our sample marry on average at age 20 and most immigrant families have male breadwinner. Our results then suggest that the option to naturalize faster is one mechanism to increase the labor force attachment of immigrants women. At the same time, our evidence also refutes concerns that faster access to citizenship imposes a burden on public welfare. If anything, we find that economic self-sufficiency actually increases through shorter waiting periods.

²⁵To receive unemployment benefits, a person has to be employed and paid UI contributions for at least 12 months over the preceding three years. Unemployment benefits were means tested and 60% (67%) of the last net wage for a recipient without (with) children. Welfare benefits are available for everybody but are means-tested. In 2010, welfare benefits were about 260 Euros per month and adult in the household. Benefits for partners in the same household are somewhat lower, while benefits for children living in the household depend on their age; additional transfers cover housing allowances and running costs.

5.3 Specification Tests

In this section, we demonstrate that our estimates are robust to alternative specifications of equation (2) and violations of our identifying assumptions. Recall that our estimation approach allows for a full set of year of arrival, year of birth and calendar year effects, but imposes a second-order polynomial for general assimilation effects to avoid multicollinearity between calendar year, year of arrival and years since migration. Are our estimates sensitive to these functional form assumptions? To test this, we first allow for different degrees of polynomials in years since migration starting from a linear specification up to a fourth-order polynomial in years since migration. The dependent variable is again log personal income and all other control variables are the same as in equation (2). The first four columns of Table 5 show the results for men in the top panel and for women in the bottom panel. Not only do the estimates not change across specifications; the AIC criterion reported at the bottom of each panel shows few changes in fit across specifications. To test for the influence of age effects, columns (5)-(8) of Table 5 show the results when we go from a linear specification up to a fourth-order polynomial in immigrant's age instead. The AIC criterion again shows little improvements, and the coefficients of interest remain unchanged across all specifications. Overall then, our results on the earnings effect of a reduced waiting period are not driven by the quadratic specifications for general assimilation and age.

More generally, one might be worried that the residency requirement is correlated with other immigrant characteristics that make them perform better in the labor market even in the absence of the reforms.²⁶ As we control in our estimation (see equation (2)) for cohort of arrival and region of origin fixed effects, we identify the effect of the waiting period from variation within a given year of arrival. As such, changes in arrival cohorts over time cannot explain our results. Conditional on year of arrival, the waiting period immigrants face varies by year of birth - and hence, age of arrival (see Table 1). Research in psychology shows that immigrants who arrive at younger ages are more likely to learn the host country's language (e.g. Birdsong, 2006; Johnson and Newport, 1989; Newport, 2002) and subsequently perform better in the host country's labor market than those immigrating at later ages (Friedberg, 1992). In our context however, a younger age of arrival is not associated with a shorter residency requirement. As Table 1 shows, child immigrants have to wait longer to be eligible for citizenship than younger immigrants, while younger immigrants have to wait less than older immigrants. We further assess the concern of confounding age of arrival effects in two ways: first, we use a strategy similar to that of Bleakley and Chin (2004) by generating a variable equal to one if an immigrant arrived prior to age 11 and zero if she arrived in Germany at a

²⁶Ideally, one would address this concern by showing that the waiting period is uncorrelated with labor market performance for our immigrant sample in the pre-reform years. Unfortunately, the Microcensus data before 1990 is not suitable for such a test, while in the SOEP the sample only contains about 100 observations. Pooling men and women, we do not find any correlation between the waiting period immigrants later face and their employment or earnings prior to 1990 (not reported).

later age. Controlling for arriving before age 11 has no impact on the returns for men which remain close to zero and insignificant (see column (9), top panel of Table 5). For women, the coefficient on years since eligible actually increases somewhat (see column (9), bottom panel of Table 5). Yet, we cannot reject the null hypothesis that the coefficient is the same as in the baseline. As a second test of age of arrival effects, we drop all immigrants who arrived before the age of 8 from the estimation. Column (10) shows that the estimates for women are statistically slightly weaker in this smaller sample, but remain very similar to the baseline. Overall then, age of arrival effects cannot explain our findings.

Our identifying assumption would also be violated if age effects varied systematically across arrival cohorts, for example, because young immigrants are more (or less) favorably selected in later than in earlier arrival cohorts relative to older immigrants. Given that we cannot include a full set of birth cohort \times arrival cohort interactions, we provide two alternative tests for our identifying assumption. First, we include a separate set of birth cohort dummies for immigrants arriving prior to 1990 and those arriving after 1990. Hence, the effect of eligibility is identified as long as birth cohort effects are similar within the 1976-1989 arrival cohorts and again within the arrival cohorts 1990-2000. As a second test, we estimate an even more flexible specification by including separate year of birth dummies for each 5-year arrival group (1976-80, 1981-85, 1986-90, 1991-95, 1996-2000). The results in columns (11) and (12) of Table 5 show that estimates are very similar to the baseline and remain highly significant for women.

5.4 Potential Mechanisms

In this section, we explore potential channels for the labor market returns of women. We start out with a discussion of their employment response and then turn to three explanations for the observed wage gains: changes in labor supply; investments in human capital; and improved working conditions.

5.4.1 Employment Response

We first discuss potential explanations for the observed rise in female employment (in Table 3, column (7)). Why would access to citizenship increase employment? One might think that one explanation could be the need to demonstrate economic self-sufficiency. In that case, the rise in employment would be a precondition for naturalization rather than a behavioral response to citizenship. We think this explanation is unlikely for the following reason: only immigrants who arrived at age 15 or older have to demonstrate economic self-sufficiency (see Section 2.2). These immigrants face on average longer residency requirements than child or younger immigrants (see Table 1). If older immigrants increase their employment in order to satisfy economic self-sufficiency, that would actually generate a spurious positive correlation between employment and the waiting period (which is indeed the pattern we see in the data). If anything, we are

likely to estimate a lower bound of the true employment response. Therefore, the need to demonstrate economic self-sufficiency in part of our immigrant sample cannot explain the rise in employment.

Another explanation would be selective in-migration or other violations of our identifying assumption: our estimates would be biased, for instance, if young immigrant women were more attached to the labor force (and hence, employed) among recent arrivals than young women in earlier arrival cohorts. The reason is that we impose a constant year of birth pattern in the propensity to work across arrival cohorts. To check whether the selection of immigrants with differential work attachment could explain our result, we allow the year of birth effects to vary before and after the fall of the wall (in column (2)); and for each 5-year arrival cohort separately (in column (3) of Table 6). Even using these very flexible specifications, we still find the same employment response among women than in the baseline (which is reproduced in column (1) of Table 6). Hence, selective in-migration cannot account for the observed employment effect.

It is important to stress that citizenship makes little difference for immigrants with a permanent work permit and a continuous work history in Germany; with the exception of certain public sector jobs and certain professions, permanent work permit holders have unrestricted access to the labor market. The situation is, however, different for immigrants without a continuous work history and hence, without a permanent work permit. For them, access to citizenship provides unrestricted access to the labor market which raises the returns to market work. Immigrant women have traditionally a much lower labor force attachment and many of them entered on family-related visas (as spouse or close family member). As such, women are more likely to benefit from having faster access to citizenship than men.²⁷ To investigate this channel, we check whether the employment response we see is driven by women who have been attached to the labor market. Column (2) of Table 6 reruns our baseline on the sample of women who have previously been in paid work. The results show no effect for women previously employed. As such, the employment response we see (shown again in column (1) of Table 6) is fully explained by women who never worked before and enter the labor market for the first time.

Unrestricted access and higher returns to work might not be the only explanation for the rise in employment. There could also be a psychological component on the supply side: women with faster access to citizenship might feel more welcome in the host society. As a consequence, they are more inclined to follow the German model of female market work rather than the role model of their country of origin with traditionally very low female participation rates. To explore this explanation, we exploit the fact that many immigrants in our sample got surprised by the two reforms. Immigrants who came to Germany prior to 1990, for instance, had no idea that they would one day get access to citizenship. Furthermore, all

²⁷Prior to 1979, spouses and children of guest workers could stay in Germany, but not take up gainful employment or vocational training. After 1979, they had to wait for up to three years before obtaining a work permit. The waiting period was reduced to one year in 1990 and abolished in 2005.

immigrants who arrived in Germany after 1990 at age 15 or older did not know until 1999 that they had to wait only 8 years instead of 15 years to get eligible for citizenship. We would expect that immigrants who get surprised by the reform are less likely to follow the German role model than women who knew they could naturalize after 8 years. To test this prediction, we create an indicator whether an immigrant’s expected waiting period is longer than the actual waiting period; the indicator is zero if actual and expected waiting period coincide. We then re-estimate the effect of the waiting period for the sample of women who got surprised (in column (3) of Table 6) and those that fully anticipated their waiting period (in column (4) of Table 6). Interestingly, we find that the positive employment response is fully explained by women who knew their waiting period. We find no effect for women who did not expect to be able to naturalize or expected to be eligible only much later. The pattern suggests that women respond to the signal of shorter waiting periods sent by the host country. We next explore three channels for the sizable wage gains.

5.4.2 Changes in Labor Supply or Productivity?

Our estimates in Table 3 also show that monthly labor market income increases substantially when women face shorter residency requirements while there are zero effects for men. Gains in monthly earnings could be the consequence of two different forces: immigrants might adjust their labor supply and work longer hours, possibly in a different job. A second reason is that immigrants earn higher wages because they become more productive in their job or switch to a more productive job. To differentiate between these two sources of earnings growth, we analyze how eligibility affects hours worked (per week) and weekly earnings (monthly income divided by working hours per week).²⁸ Table 7 shows the results. For men, weekly earnings, our proxy for productivity, increase with faster eligibility. At the same time, men reduce their working hours though we see no effect on the share of men working full-time. The decline in working hours is about 1.3 hours per week (evaluated at the 7 year difference in residency requirement), a reduction of only 3%. A decline in hours worked would be consistent with the income effect dominating the substitution effect. The net effect of the increase in productivity and the decrease in hours is that monthly labor income for men remains unchanged (as shown in Table 3, column (4)).

The patterns are quite different for women. For them, all of the improvements in monthly labor market income comes from longer working hours. Using the difference in residency requirements of 7 years, women work about 2.8 hours per week more which is an increase of 10%. Column (7) of Table 7 further shows that the share of women working full-time increases by 10 percentage points (or 20%). As part-time work carries a substantial wage penalty in Germany, longer working hours and more full-time work are

²⁸Weekly earnings might still contain a labor supply component as immigrants might adjust the number of weeks they work per month. Unfortunately, we have no information on the number of weeks worked which would allow us to analyze hourly wages rather than weekly earnings.

important determinants of the large income gains among immigrant women.

Finally, both men and women also have more stable careers when they face shorter waiting periods (shown in columns (4) for men and (8) for women): job tenure for men increases by about one year or 16%; job tenure for women increases by 0.61 years which is equivalent to an improvement by 12%. Given that women with a low attachment to the labor market typically work in jobs with high turnover rates and low wages, the increase in job stability is another indicator that the economic position of women in the labor market improves with faster eligibility.

One might be worried that the reduction in working hours among men could be related to the need to demonstrate economic self-sufficiency. We think this explanation is unlikely for three reasons: first, the decline in male working hours is with 3% rather small. Second, immigrant men work both longer hours and earn much more than immigrant women. As such, economic self-sufficiency should be a much bigger concern for immigrant women who would like to naturalize. Yet, women actually increase their working hours after eligibility rather than reducing it. One might argue that economic self-sufficiency is of less concern for women because they are more likely to naturalize as a spouse or partner of a native or eligible immigrant. This interpretation is, however, not supported by the aggregate data: women are with 31% only slightly more likely than men with 27% to naturalize through marriage or other family reasons (BAMF, 2012). Finally, it is only older immigrants, who face longer waiting period on average, that have to demonstrate self-sufficiency. If anything, the need to demonstrate economic self-sufficiency would actually generate a spurious positive relationship between working hours and the waiting period. As such, economic self-sufficiency alone cannot explain the documented changes in working hours among men.

5.4.3 Investments in Human Capital

Investments in education could be another important margin of adjustment, especially since the immigrants in our sample are quite young upon arrival. The incentives to invest in education should increase for at least two reasons: faster access to citizenship enables the immigrant to reap the benefits of additional education over a longer time period, for example, because immigrants are less likely to return to their home country and educational returns are higher in Germany than in the source country. In addition, the returns to skills might themselves rise because of better training and career opportunities in the labor market. Shorter waiting periods might then play an important role for these decisions, especially if teenage immigrants suffer from present bias, and hence heavily discount the future benefits of educational investments. To shed light on educational investments, we investigate whether immigrants are more or less likely to be low-skilled (with no high school or vocational degree), medium-skilled (with either a high

school or vocational degree) or high-skilled (with a college or university degree). Furthermore, we analyze whether an immigrant currently attends general or vocational school. We thus re-estimate equation (2) where we now use our indicators for the educational degree or current school attendance as dependent variables. All right-hand side variables are the same as before.

Table 8 shows several interesting patterns. First, reduced residency requirements increase educational investments for both men and women: they are less likely to have no educational degree and more likely to have a high school or vocational degree. The positive effect for medium-skilled is largely explained by more immigrants completing vocational training rather than finishing a high school degree. In turn, we find few effects on finishing a college or university education. Hence, most of the additional investments occur in the middle rather than the top of the educational distribution - which is, however, to be expected given that most immigrants are relatively low-skilled.²⁹ Second, men invest more in additional education and training than women. Evaluated at the 7 year difference, men are 6.3 percentage points less likely to have no educational degree (an improvement of 14%), while women are only 2.1 percentage points less likely (an improvement of only 4%). Why do men invest more in education than women? We think this is related to the much higher labor force attachment of immigrant men compared to immigrant women (compare the 71.1% for men to the 52.4% for women in Table A1). As long as the returns to vocational education are higher in the labor market than outside the labor market (for educating children, for example), we would expect men to invest more in formal skills than women. In fact, we find no statistically significant additional investments among women who are not employed (not reported).³⁰

One might be worried that the observed changes in education are the result of a selection effect. If young immigrants were more likely to invest in education among more recent cohorts than young immigrant in earlier arrival cohorts, our identifying assumption that year of birth patterns in education are constant across arrival cohorts would be invalid. To test this assumption, we allow the year of birth fixed effects to vary for arrivals before and after 1990; and for every 5-year arrival cohort. The results for the likelihood to be medium-skilled are shown in Table A3. Columns (2) and (3) for men and columns (6) and (7) for women demonstrates that the results are very similar to the baseline reproduced in column (1) for men and column (5) for women.

²⁹Results for formal education are stronger for children arriving before age 16 which marks the end of compulsory schooling in Germany. Among these younger immigrants, both men and women are more likely to obtain a college or university degree; and even more men and women obtain a vocational degree instead of no degree (not reported). Note that these results cannot be explained by the lower age of arrival alone. The reason is that immigrants who arrived in Germany before turning 8 (at age 4, for example) actually have a longer residency requirement (12 years in this case) because they can naturalize only when they turn 16.

³⁰Note that our analysis here is restricted to first-generation immigrants; we have nothing to say how access to citizenship after the 1991 and 2000 reforms affects the children of eligible immigrants who might have naturalized along with their parents. We leave this question for future research.

The structure of the reforms allows an additional test whether the observed educational investments are the consequence of access to citizenship or some other unobservable factor correlated with our treatment variable. As for employment responses, we can use the surprise component of the reform to check whether immigrants who anticipated their waiting period invest more in education than those that expected a longer wait but in the end faced the same waiting period (see the discussion in Section 5.4.1 above). To test this prediction, we again use the indicator whether an immigrant's expected waiting period is longer than the actual waiting period; the indicator is zero if actual and expected waiting period coincide. The last specification in Table A3 (column (4) for men and column (8) for women) shows that immigrants who get surprised (for which the indicator is one) invest much less in additional education than immigrants who knew their residency requirement in advance. This result is consistent with the idea that immigrants who could anticipate the waiting period are more likely to invest in education as they expect to reap the benefits sooner rather than later.

Immigrants with faster access to citizenship might also invest in learning the host country language. While language skills are not observed in the Microcensus, we can analyze them using the SOEP. The dependent variables are two indicator variables equal to one if an immigrant reports speaking (writing) in German well or very well; the variables are zero if the immigrant has no or bad command of the spoken (written) language. The specification is again the same as in equation (2). Table 9 shows the results. Men improve both their ability of writing and speaking in German. Evaluated at the 7 year difference, men are 12.6 percentage points more likely to speak German very well and 10.5 percentage points more likely to write German very well. Women improve their speaking ability by around 10 percentage points. We see no statistically significant effect on women's writing skills though the coefficient is of the expected sign. The coefficients do not change much if we control for education which suggests that improvements in language skills occur at all educational levels and not just because of more formal education. In sum, we find that immigrants invest more in specific human capital when they face shorter residency requirements. Furthermore, men invest more in host country-specific skills than women which explains why men become more productive on the job.

5.4.4 Job Characteristics

Finally, we investigate whether faster access to citizenship affects the working conditions and types of jobs immigrants hold. As discussed in the introduction, citizenship provides access to certain restricted jobs, for example, in the public sector. In addition, immigrants with faster access to citizenship might have better chances of moving up the job ladder, for example by switching from a blue-collar to a white-collar job; or, by leaving low-paid self employment. Table 10 explores in more detail whether a reduced waiting

period changes the type of jobs immigrants hold. For men (shown on the left-hand side of Table 10), we find that they are more likely to work in a public sector job. The higher probability of public sector employment is in line with immigrants no longer facing any entry restrictions for government jobs. Men are also less likely to be self-employed. Evaluated at the 7 year difference in residency requirement, public sector employment increases by 2.8 percentage points and self-employment declines by 3.5 percentage points. Women with a reduced residency requirement in turn are more likely to work in a white-collar job (9 percentage points) and less likely to have a temporary work contract (4.2 percentage points).³¹ While we saw that women do not become more productive on the job through additional investments in education and, to a lesser extent, language, these additional investments might still have non-monetary benefits through better working conditions and more pleasant jobs. Overall then, both men and women with faster access work in more stable jobs (in a regular employment with a permanent work contract) which offer better working conditions (like a white-collar or public sector job).

6 Additional Robustness Checks

6.1 Selective In- or Out-migration

This section discusses several tests whether our results might be explained by selective in- or out-migration. The reforms might change the type of immigrants entering Germany: it might attract, for example, immigrants who wish to settle permanently in the destination country. As we control in our estimation (see equation (2)) for cohort of arrival fixed effects, we only compare the outcomes of immigrants arriving in the same year. As long as changes in inflows are not systematically correlated with the waiting period immigrants face, our estimates will be unaffected by changes in inflows. Suppose, however, that immigrants facing shorter residency requirements are more likely to go to Germany after the reforms (to take advantage of the opportunities to become a citizen, for example); and that they are also more positively selected after the reforms than older immigrants. In that case, our estimates could reflect the more positive selection of immigrants rather than an effect of citizenship policy. To address this specific concern, we allowed in Section 5.3 and 5.4.1 above cohort of arrival effects to vary across birth cohorts (see columns (11) and (12) of Table 5, for instance). The most flexible specification (in column (12)) identifies the effect of the waiting period for the same arrival cohort and within 5-year birth cohorts. Our estimates are hardly changed even then which suggests to us that residency requirements do not appear to be correlated with unobserved immigrant quality conditional on arrival year, year of birth, region of origin and our other

³¹The fact that women have better jobs (less likely to be self-employed or on a temporary contract, but more likely to be employed in the public sector) is even more pronounced among women who got eligible in the current or past year among recent arrivals - compared to immigrants who got eligible earlier (not reported).

control variables.

Our estimates could also be affected by selective return migration or sample attrition more generally. As the immigrant sample is relatively young - its age varies from 16 to 49 during the 2005-2010 period - survivor bias due to mortality is of minor concern. A possibly more important concern is selective out-migration. The literature suggests that 20-50% of an immigrant cohort leave within 10 years of arrival in the host country (Lubotsky, 2007; or Abramitzky et al., 2012 for recent evidence; Dustmann and Göhrlach, 2014 for a survey). While we cannot observe return migration in the Microcensus, we implement three alternative tests. First, if selective out-migration or attrition is not an issue, pre-determined characteristics like age or country of origin for a given arrival cohort should remain stable from 2005 to 2010. Table A4 shows for 5-year arrival cohorts their mean age and their share from Turkey, ex-Yugoslavia and EU member states, the three largest immigrant groups, in 2005 and 2010. The t-statistics report whether the distribution of the pre-determined characteristic changes for a given arrival cohort between 2005 and 2010. The first three columns of Table A4 show that the age distribution remains very stable between 2005 and 2010 for all arrival cohorts. This result is reassuring as arrival cohort and age are important determinants of the residency requirement. We also find that the share of two of the three largest immigrant groups changes between 2005 and 2010 for recent arrival cohorts: immigrants from ex-Yugoslavia are less likely to leave the sample (see columns (7)-(9) of Table A4), while immigrants from the traditional EU-15 member states seem to be more likely to return (columns (10)-(12) of Table A4). These differences across source countries are not a direct issue for our estimation as we control in all our estimations for the region of origin. Yet, it might raise concerns that other unobservables correlated with our treatment variable are correlated with out-migration. Given that outmigration and changes in pre-determined characteristics are most relevant among recent arrivals, we drop all recent immigrants (arriving since 1990), for which return migration might be a concern. The results shown in Table A6 (and discussed in the next subsection) remain qualitatively unchanged which indicates that selective return migration among recent arrivals does not explain our findings.

Our second approach to assess the issue of differential return migration is to calculate bounds on the average treatment effect (following Lee, 2009). As the bounds approach was developed for the binary case, we split our sample into a treatment and control group: the new treatment variable is equal to one if an immigrant faces 8 years of residency; the variable is equal to zero if an immigrant has to wait longer than eight years. As we are mostly worried about differential return migration by age, we calculate the difference in age between both groups (which is 5.6 years). To assess the impact of differential return migration, we make two alternative assumptions on the return pattern: the first assumption is that older immigrants are less likely to return; based on estimates from Dustmann (2003), the 5.6 years age difference then

translates into a higher return probability among younger immigrants, our treated group, of 3.2%. The basic idea of the Lee bounds is to trim the outcome (log personal income) of the control group assuming that the “excess” return migration all occurs at the top or at the bottom of the earnings distribution. After trimming, we can re-estimate the average treatment effect to obtain a lower and upper bound on the average treatment effect. The results for men and women are shown in the bottom panel of Table A4. We first rerun the baseline model for the binary treatment variable which again shows no effect for men and positive earnings effects of a shorter waiting period for women (see columns (1)-(4) in the bottom panel of Table A4). We then report the lower and upper bounds for men and women in columns (5)-(8) of Table 4 respectively. The bounds are wide and include zero for men; for women, both bounds are above zero. Our second assumption on the return pattern is that younger immigrants, possibly because of their faster access to citizenship, are less likely to return. In the absence of reliable numbers, we assume that the treatment group is now 3.2% less likely to return than the control group. Following an analogous approach, the bounds for this alternative differential attrition pattern are shown in columns (9)-(12) of Table A4. Again, we confirm our basic finding that there are no effects for men, but sizable earnings gains for women.

As a third test of the influence of return migration, we rely on the SOEP data to check whether sample attrition, due to out-migration, for example, is correlated with actual naturalization or the residency requirement an immigrant faces. The dependent variable is now the probability of leaving our sample (either due to mortality, emigration or other dropout). All regressions include the same set of control variables as before. Table A5 shows that attrition from the sample is somewhat less likely for those who eventually naturalize or those currently naturalized; but none of the coefficients reaches statistical significance. This result is not surprising because we would expect that naturalized immigrants have a longer-time horizon in the host country and are therefore less likely to return home. Most importantly, we find no correlation between sample attrition and whether an individual is eligible or the waiting period immigrants faced. Based on this evidence, return migration seems unlikely to be a concern for our study.

6.2 Alternative Samples and Controls

We next demonstrate that our results are robust to additional controls and alternative sample definitions. As mentioned in Section 5.1, some immigrants in the sample might qualify for citizenship through alternative channels. The most important fast track to citizenship is by marrying a German citizen. Foreign spouses of citizens can apply for naturalization after three years of residency.³² Therefore, some of the

³²The immigrant has to be married for at least two years by the time he or she applies for naturalization; furthermore, the spouse has to have a German citizenship for at least two years. Finally, the couple has to have a permanent residence

immigrants in our sample would be eligible for naturalization much faster than our residency requirement variable indicates. Naturalization through marriage is expected to be more important for our older control group. In that case, we possibly underestimate the returns to citizenship. To check whether this could explain the absence of returns for male immigrants, we drop all immigrants who report having a German spouse in 2005-2010.³³ The results reported in the first row of Table A6 show a similar pattern as before: no effects for men and slightly stronger effects on employment and labor market income for women than in the baseline. Second, our sample might still contain ethnic Germans who are not affected by the citizenship reforms we study. The second row therefore restrict our data to the 2007-10 period when immigrants were explicitly asked whether they were eligible as ethnic Germans. Dropping all immigrants who declare to be eligible for citizenship as ethnic Germans has little effects on our estimates, however.

Another potential issue is that the citizenship reform in 2000 not only changed the residency requirement for adult immigrants; it also granted citizenship by birth to children born in Germany on or after January 1, 2000 to foreign-born parents. The 2000 reform also contained a retrospective component where children born between 1990 and 1999 could be naturalized if their parents applied for it in 2000. However, the take-up rates of this retrospective component was very low (around 10%). It is important to stress that there is no direct effect of these provisions as our sample is restricted to first-generation immigrants which cannot naturalize through birth by definition. However, first-generation immigrants could still be affected by the *jus soli* reform through their German-born child who obtains citizenship by birth. Parents might potentially reduce (or adjust) their labor supply in order to give their newborn child a good start in the host country. In that case, the labor market effects we find for immigrant mothers might be the consequence of citizenship by birth for immigrant children. We address this concern in two ways. The third row in Table A6 drops all immigrants with children under age 15 (which were all born before 1995 and mostly born before 1990) in the households which were not directly affected by the reform. The fourth row uses the SOEP data prior to 2000 - and hence, before the *jus soli* reform - to re-estimate the returns to eligibility. For men, we again find no effects on employment or monthly earnings, while we still find sizable effects for women along both dimensions. Actually, we find higher employment and income effect once we drop households with children under 15 or focus on the years prior to 2000 which suggests that the *jus soli* elements of the 2000 reform cannot explain our findings.

permit.

³³Note that we only observe their current spouse, not the spouse or partner an immigrant had when they first lived in Germany. Some immigrants we drop from the sample might have naturalized through the provisions of the 1990 or 2000 reforms, but married a German citizen only afterward. And some immigrants might have naturalized through a German spouse, but got divorced before we observe them in the 2005-2010 sample period. We think that the number of immigrants we misclassify should be small relative to the number of immigrants with a German spouse in the 2005-2010 period. We find similar results if we use the SOEP where we have annual information on the immigrant's partner from 1984-2009 (not reported).

As noted in the data description, our sample of immigrants consists of both economic migrants and their families as well as refugees who obtained political asylum in Germany. Yet, the number and the origins of refugees and asylum seekers tend to change over time. After the opening of the Iron Curtain, for instance, large numbers of asylum seekers began to arrive in Germany.³⁴ Refugees who are granted political asylum face the same naturalization criteria as other immigrants; yet, in some cases, the residency requirement could be reduced to six years. As such, some refugees might have naturalized earlier than our definition of eligibility indicates. To investigate the influence of refugees and asylum seekers on our estimates, we split the sample by refugee status. Unfortunately, as in most data sources, our data do not record whether an immigrant arrives in Germany as a refugee or applies for asylum. As a proxy for refugee status, we use immigrants from ex-Yugoslavia and the Middle East which formed the largest groups of refugees during that time. The fifth row in Table A6 shows that dropping asylum seekers slightly increases the wage effects for women (compared to Table 3, column (8)). Estimating the baseline on the sample of refugees from ex-Yugoslavia and the Middle East in row (6) shows that we again find no effect for men; a larger positive employment response for refugees facing shorter waiting periods and no statistically significant effect on wages. The stronger employment response is in line with evidence found for Switzerland that asylum seekers who had to wait longer for the decision on their asylum application had worse medium-run employment outcomes than refugees who obtained their decision faster (Hainmueller et al., 2016).³⁵

Finally, other changes in the German economy might influence our results. Germany’s labor market experienced a substantial inflow of migrants after the fall of the Berlin Wall and the opening of the Iron Curtain. In addition, wage inequality in Germany increased in the late 1990s and 2000s with substantial net gains for the high-skilled but net losses for the low-skilled. In principle, these changes might be absorbed by year dummies or state-specific trends. Our reduced-form estimates would, however, be biased if business cycle effects or secular wage changes were somehow correlated with age. The seventh row drops all East German states because immigration flows and labor market dynamics differ substantially between East and West Germany. Alternatively, we include state-level unemployment rates and GDP growth rates to our specification in the eighth row. In both cases, results are remarkably similar to our main results.

As discussed in the previous section, our estimates could be affected by selective out-migration. To control for this possibility in yet another way, we drop all immigrants who arrived in Germany since 1990

³⁴Faced with ever-increasing numbers of refugees, the federal government restricted access to political asylum in 1993. After 1993, immigrants from source countries that are considered safe, or those arriving from safe third countries (which included all of Germany’s geographic neighbors) could no longer apply for political asylum in Germany.

³⁵Strictly speaking, we cannot isolate whether the stronger employment response among women is because they are asylum seekers or because women from ex-Yugoslavia and the Middle East react differently to the waiting period than other immigrants. Given that we find little heterogeneity with respect to the source country’s wealth (see Table A7), the former interpretation seems more likely, however.

for which return migration might matter (see Table A4). The last row of Table A6 shows that we still find the same pattern for employment and earnings though the estimates are slightly smaller than in the baseline of Table 2 and lose significance for employment.

6.3 Heterogeneity of Returns

Until now, we have estimated the average return to citizenship eligibility in the labor market. Yet, the benefits of naturalization might differ across immigrants, for instance, because immigrants from poorer countries outside the European Union face more restrictions on job and occupational mobility even with a permanent work permit. To assess the heterogeneity of returns, we merge information on the GDP per capita in the source country in 2005 from the Penn World Tables (Heston et al., 2011) and interact the eligibility indicator with the GDP per capita in the immigrant's source country.³⁶

Table A7 reports the results for employment, working hours and monthly labor income where we allow the effect of the residency requirement to vary by the wealth of the source country. On the employment margin (shown in column (1) for men and column (4) for women), we find little heterogeneity: effects are zero for men and positive for women as in the baseline (see Table 3). For working hours, we find essentially no heterogeneity for men. Working hours are higher for women from richer countries; yet, a shorter waiting period increases working hours more for female immigrants from poorer countries. We find a similar pattern for monthly earnings: shorter waiting period benefit especially women from poorer countries. To take one example: the GDP per capita in Turkey in 2005 was 7,091 Euros (the median in our sample) and 619 Euros in Afghanistan (the minimum in our sample). Taking the main and interaction effect from column (6) in Table A7, the return for a Turkish woman is $0.027 - 0.002 * 7.091 = 0.013$. The return for an Afghan woman in turn is $0.027 - 0.002 * 0.691 = 0.026$. Hence, a reduced residency requirement increases earnings by about twice as much for women from the poorest countries compared to women from the median income country. As in the baseline, the higher earnings gain for women from poorer countries is mostly explained by their larger labor supply response at the intensive margin: immigrant women from poorer countries increase their working hours more than women from richer source countries. As such, reduced residency requirements not only speed up the economic assimilation of women overall, but also benefit those women from the poorest and least advantageous countries the most.

³⁶The number of observations for this specification is lower because we can merge GDP data only with immigrants for which we observe the actual country of origin (e.g. Turkey), not only the region of origin (e.g. Asia).

7 Conclusion

Over the past decades, Germany has moved from a country where citizenship was closely tied to ancestry to a more liberal approach to citizenship. We analyze whether shorter waiting times for naturalization improve the economic assimilation of immigrants. For the empirical analysis, we exploit the fact that residency requirements for immigrants vary non-linearly across birth and arrival cohorts.

We document substantial earnings gains for immigrant women. Most of the benefits for women come from a stronger labor market attachment both at the extensive and intensive margin: women are more likely to work for pay, more hours, they are more likely to work full-time and have more stable employment relationships.³⁷ Our second important result is that faster eligibility improves the formal education and language skills of all immigrants. For both host country-specific skills, men invest more than women. This result is, however, not surprising given that men have been traditionally much more attached to the labor market than women. As long as returns to skills are higher inside the labor market than for non-market work, incentives to invest are higher for men than for women.

The third interesting result is that immigrant men become more productive in their job when facing shorter residency requirements. Yet, there is no gain in monthly earnings as the higher productivity is compensated by a reduction in working hours. Why do we see a productivity effect for men, but not for women? We think there are three reasons for this pattern: first, women invest less in vocational training and language than men; hence, we would expect productivity gains to be stronger for men than for women. Second, we find sizable entry into the labor market by low-wage women with faster eligibility. First-time entrants into the labor market will therefore dampen any productivity effect we see for experienced women. Finally, women still benefit in the labor market through improvements in working conditions: they have more stable employment relationships, they are less likely to work on a temporary contract and more likely to be employed in a white-collar job.

Overall, the analysis clearly suggests that a more liberal citizenship policy boost the economic integration of immigrants - mostly because immigrants make different choices in terms of human capital investment and labor supply. The earnings gains are largest for immigrant women who had traditionally much less labor market attachment. As such, a liberal citizenship policy contributes to gender equality

³⁷Our empirical evidence differs from an earlier study for Germany which finds wage returns for men, but no gains for women (Steinhardt, 2012). There are several important differences to our analysis: first, our sample includes all employment including self-employed and temporary jobs not subject to social security contributions. As immigrants have higher rates of self-employment on average, this difference is likely to be important. Second, in the social security data, an employee's citizenship is reported by the employer which is likely to be measured with error. As women have less stable careers with frequent changes of employer, their information on citizenship is likely to be less reliable (resulting in a downward bias in returns for women). Finally, the social security data does not contain any information on the year of arrival in Germany. Since time in Germany is positively correlated with naturalization, omitted variable bias will overestimate the returns to citizenship. As men have spent more time in Germany, this bias is likely to be more severe for men than women.

in the immigrant population as it improves the relative economic position of women. While it is difficult to make any predictions about the integration of the the recent refugee population, our study clearly indicates that clever policies in the host country can contribute a lot to economic integration.

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A Data Appendix

A.1 German Microcensus (2005-2010)

Data and Sample: The Microcensus interviews about 830,000 individuals each year. Participation is required by law (though answering some questions is voluntary) as the data form the basis for the calculation of nationally representative labor market statistics. The scientific use file is a 70% sub sample of the official data set. We restrict the sample to first-generation immigrants, i.e. foreign-born individuals who live in private households in Germany. For each person, we know the year the person arrived in Germany and the country of origin. Individuals born abroad to German parents are also contained in the foreign-born sample but can be identified as their country of origin is missing. We further restrict our sample to immigrants who arrived in Germany between 1976 and 2000 and are between 16 and 30 years-old when they get first eligible for German citizenship. To focus on labor market returns to citizenship, we also constrain the sample to individuals who have had at least one income-generating job during their life. Since 2005, the survey records whether and how an immigrant has obtained German citizenship and the year in which naturalization took place. To define our sample of interest, we first calculate the number of years an immigrant has lived in Germany. Together with the year of birth of an individual in the post-reform period, we then define the year an immigrant is first eligible for citizenship based on the residency requirement. An immigrant arriving in 1976 becomes eligible for citizenship in 1991 independent of her age. Adolescent immigrants (ages 16-22) arriving between 1977 and 1982 become eligible in 1991 while those arriving between 1983 and 2000 become eligible after 8 years (between 1991 and 2009). Adult immigrants (ages 23 and older) arriving between 1977 and 1985 become eligible after 15 years of residence (between 1991 and 2000). Adult immigrants arriving between 1986 and 1991 all become eligible in 2000 when the reduced residency requirement comes into effect. All adult immigrants arriving between 1992 and 2000 become eligible after 8 years of residency (between 2000 and 2009). In addition, immigrant children who have lived legally in Germany for at least 8 years become eligible when they turn

16. In the final step, we then calculate the number of years an immigrant has been eligible for German citizenship in the 2005-2010 period.

Dependent variables: Our primary outcome variable is the log of monthly net personal income. To deflate income to constant Euros, we use the consumer price index from the Federal Statistical Office (with 2005 as the base year). The income variable is recorded as a categorical variable with 24 categories. We use the midpoint of each category to convert personal income into a continuous variable. Our second outcome variable is employment. The question about employment asks whether an individual has been working for pay or has been engaged in an income generating activity in the previous week. We define a person as employed if she works full-time or part-time, works for less than 400 Euros per month, works in a family business or works in a job temporarily. A person is not employed in the current year if she is either unemployed, on long-term parental leave (longer than three months) or out of the labor force.

Control variables: Educational attainment is defined as low-skilled if the individual has no vocational degree and at most a lower secondary school degree. A migrant is medium-skilled if she has a vocational degree or high school degree; and she is high-skilled if she has a college degree. Individuals still attending general or vocational school are coded as a separate category. We further define ten broad regions of origin based on the current citizenship (for those who do not naturalize) or the citizenship prior to naturalization (for those naturalized). The first group (EU15: Austria, Belgium, Denmark, Finland, France, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and United Kingdom) includes all countries from the European Union before the enlargement of 2004 as well as Switzerland and Norway. Immigrants in this group of countries have had free access to the German labor market since the 1990s. The second group consists of immigrants from Eastern European countries which joined the EU in 2004 but did not have full access to the labor market prior to 2011 (EU12: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia as well as Malta and Cyprus). The other important source countries are former Yugoslavia except Slovenia (Bosnia and Herzegovina, Croatia, Kosovo, Macedonia, Montenegro, Serbia) and Turkey. We lump together other immigrants into broad regions: the Middle East (for example Afghanistan, Iran and Iraq), Africa (for example Morocco), Asia (for example China and Vietnam), North and South America as well as Russia and other former Soviet republics which are not member of the European Union. The last category contains immigrants who either have no exact region of origin (“other European country” or “rest of the world”) or report not having any citizenship at all. To test whether immigrants from lower-income countries benefit more from naturalization, we use the GDP per capita in the country of origin (divided by 1,000) in 2005 from the Penn World Tables (Heston et al., 2011). The sample including the GDP data is smaller as we can only match immigrants where we know the actual country of origin and not only the broad region (such as North Africa).

A.2 Socio-Economic Panel (1984-2009)

Data and Sample: The Socio-Economic Panel (SOEP) is a household survey that has been conducted annually since 1984 (in East Germany since 1990). The original sample oversampled migrants from traditional sending countries (like Turkey, Yugoslavia or Italy). Several refreshment samples including another immigrant sample added in 1994/95 have been drawn in subsequent years to maintain the representativeness of the SOEP. Interviews are performed in German, the respondent’s native language or a mixed mode. Our basic sample consists of all foreigners living in private households who were born abroad and migrated to Germany between 1976 and 2000 (“first-generation immigrants”). The survey asks respondents whether they are German citizens; if they answer no, the respondent is asked about his or her current nationality. We can then identify naturalizations if the first-generation immigrant reports a German citizenship in the current year and a foreign citizenship in previous years. Note that this definition only captures individuals who naturalize while participating in the SOEP; it does not capture naturalizations that occur prior to or after being a SOEP participant which introduces two potential sources of bias: first, a sample member might drop out of the SOEP and naturalize after leaving the sample. If an immigrant instead naturalizes before she enters the panel, we only observe that a first-generation immigrant is naturalized but not in which year. In the main analysis, we restrict our sample to first-generation immigrants who naturalize while being a sample member in the SOEP. To the extent that this sample is representative of immigrants more broadly, this should not affect our results. Alternatively, we assign the first observation in the panel as the year of naturalization; this would understate the effect of eligibility (which is measured independently from sample membership) and understate the returns of naturalization (because naturalization is defined later than it actually occurred). In both cases, our coefficients are conservative estimates of the true effect. In 2002, the survey asks all naturalized immigrants in which year they obtained their German citizenship. We use this information together

with additional consistency check to reduce measurement error in the naturalization variable. To distinguish first-generation immigrants from ethnic Germans, we use the same procedure as in the Microcensus (following Birkner, 2007).

Dependent variables: Language skills are self-reported competencies on a scale from 0 to 4 and available every second year (1984-1987, 1989, 1991, 1993, 1995, 1997, 1999, 2001, 2003, 2005, 2007 and 2009). We code two binary indicator for writing and speaking ability which is equal to one if a person reports very good or good language skills and zero otherwise. Finally, our dropout variables is an indicator equal to one if the individual has died, left the sample because of emigration or for other reasons.

Control variables: Educational attainment is defined as in the Microcensus: low-skilled if an immigrant has no vocational degree and at most a lower secondary school degree; medium-skilled if she has a vocational degree or high school degree; and high-skilled if she has a college degree. Individuals still attending general or vocational school are assigned a separate category. We use the same definition as in the Microcensus to classify source countries into ten broad groups of origin.

Table 1: Variation in Access to Citizenship after the 1991 and 2000 Citizenship Reforms

Group	Age of Arrival in Germany	Residency Requirement for Citizenship	Access to Citizenship at Age	% in the Sample
Child Immigrant	Ages 0-7	9-16 Years (possibly longer for arrival cohorts 1976-1982)	Age 16 (older for arrival cohorts 1976-1982)	23.9%
Younger Immigrant	Ages 8-14	8 Years (9-15 years for arrival cohorts 1976-1982)	Ages 16-22 (older for arrival cohorts 1976-1982)	26.7%
Older Immigrant	Ages 15-22	15 Years (9-14 years for arrival cohorts 1986-1991) 8 Years (arrival cohorts 1992-2000)	Ages 30-38 (younger for arrival cohorts 1986-1991) Ages 23-30 (arrival cohorts 1992-2000)	49.4%

Notes : The table reports the basic variation induced by the 1991 and 2000 citizenship reforms in the residency requirement (our key independent variable) by year of arrival and age of arrival of the immigrant.

Table 2: The Propensity to Naturalize and the Timing of Naturalization

	Naturalized		Years since Naturalized	
	(1)	(2)	(3)	(4)
Residency Requirement (in years)	-0.013*** [0.002]	-0.012*** [0.002]	-0.044 [0.035]	-0.039 [0.035]
Years in Germany	0.032*** [0.007]	0.032*** [0.007]	-0.354** [0.148]	-0.368** [0.148]
Years in Germany ²	-0.000 [0.000]	-0.000 [0.000]	0.026*** [0.004]	0.026*** [0.004]
Age	0.032*** [0.008]	0.026*** [0.008]	0.493*** [0.155]	0.424** [0.168]
Age ²	-0.000*** [0.000]	-0.000** [0.000]	-0.006** [0.002]	-0.005* [0.003]
Male	0.005 [0.005]	-0.002 [0.005]	-0.342*** [0.091]	-0.350*** [0.092]
Medium-skilled		0.093*** [0.005]		0.418*** [0.107]
High-skilled		0.154*** [0.011]		-0.424** [0.208]
In School or Training		0.012 [0.013]		-0.201 [0.198]
Cohort of Arrival Fixed Effects	Yes	Yes	Yes	Yes
Year of Birth Fixed Effects	Yes	Yes	Yes	Yes
Region of Origin Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes
State-specific Linear Trends	Yes	Yes	Yes	Yes
Observations	38,692	38,692	14,517	14,517
R Squared	0.259	0.268	0.372	0.373
Mean of Dependent Variable	0.38	0.38	10.3	10.3

Notes : The dependent variable is a binary indicator equal to one if a migrant has naturalized in a given year and zero otherwise (in columns (1) and (2)) and the years since an immigrant has naturalized if he or she naturalizes (in columns (3) and (4)). The sample includes all first-generation immigrants who are not ethnic Germans, arrived in Germany between 1975 to 2002 and were 0-22 years old when they arrived in Germany. In columns (3) and (4), the sample is further restricted to naturalized immigrants. The residency requirement is equal to the number of years an immigrant has to wait before becoming eligible for German citizenship. The variable is calculated from the eligibility rules of the 1991 and 2000 immigration reforms. An immigrant who arrived before the age of 8 becomes eligible when they turn 16 after 1991 - or after 9 to 16 years of residency. Immigrants who arrive in Germany between the ages of 8 and 14 become eligible after 8 years after 1991 when they are between 16 and 22 years-old. Finally, immigrants who arrive in Germany at age 15 or older become eligible after 15 years after the 1991 reform and after 8 years after the 2000 reform. Additional variation in the residency requirement arises because of the timing of the reforms (see Table 1 and the discussion in Section 4.2 for details). Even columns also control for education where the reference category is low-skilled (without a high school or vocational degree). All specifications include in addition year of arrival and year of birth fixed effects, current year and state fixed effects, state-specific linear trends and ten region of origin fixed effects (traditional EU member countries, new EU entrants (EU-12), ex-Yugoslavia, Turkey, Middle East, Asia, Africa, North and South America, Russia and other former Soviet Union republics, other or no citizenship). Standard errors in brackets are clustered by age x arrival year. Statistical significance: *** p<0.01, ** p<0.05, * p<0.1.

Source : Microcensus (2005-2010).

Table 3: Actual Naturalization, Eligibility and Labor Market Outcomes

	<u>Men</u>				<u>Women</u>			
	<u>Employment</u>	<u>Log Personal</u>	<u>Employment</u>	<u>Log Personal</u>	<u>Employment</u>	<u>Log Personal</u>	<u>Employment</u>	<u>Log Personal</u>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Naturalized	0.044*** [0.007]	0.062*** [0.011]			0.058*** [0.008]	0.124*** [0.017]		
Residency Requirement (in years)			0.001 [0.002]	-0.003 [0.004]			-0.008*** [0.003]	-0.016*** [0.005]
Years in Germany	-0.017* [0.009]	-0.007 [0.013]	-0.016* [0.009]	-0.003 [0.013]	0.028*** [0.010]	0.032 [0.020]	0.034*** [0.010]	0.041** [0.021]
Years in Germany ²	0.000* [0.000]	0.000 [0.000]	0.000* [0.000]	0.000 [0.000]	-0.000* [0.000]	-0.000 [0.001]	-0.000 [0.000]	-0.000 [0.001]
Age	0.145*** [0.014]	0.229*** [0.023]	0.146*** [0.014]	0.230*** [0.023]	0.054*** [0.015]	0.130*** [0.028]	0.076*** [0.014]	0.139*** [0.028]
Age ²	-0.002*** [0.000]	-0.003*** [0.000]	-0.002*** [0.000]	-0.003*** [0.000]	-0.001*** [0.000]	-0.002*** [0.000]	-0.001*** [0.000]	-0.002*** [0.000]
Cohort of Arrival Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year of Birth Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region of Origin Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State-specific Linear Trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	18,310	12,351	18,310	12,351	19,119	9,469	19,119	9,469
R Squared	0.211	0.369	0.209	0.367	0.125	0.114	0.123	0.109
Mean of Dependent Variable	0.71	7.16	0.71	7.16	0.52	6.54	0.52	6.54

Notes: The left-hand side reports results for immigrant men, the right-hand side for immigrant women. The first two specifications (columns (1)-(2) and (5)-(6)) report OLS estimates of the relationship between naturalization and labor market outcomes. The last two specifications (columns (3)-(4) and (7)-(8)) report reduced-form estimates between the residency requirement for naturalization and labor market outcomes. The dependent variables are whether a person is gainfully employed (in odd columns) and log monthly personal income adjusted to 2005 prices if employed (in even columns). The sample includes all immigrants who arrived in Germany between 1975 and 2002 and were between 0 and 22 years old when they arrived in Germany. We exclude ethnic Germans, i.e. immigrants with German ancestry who had faster access to German citizenship than regular immigrants. The residency requirement denotes the number of years an immigrant has to wait before becoming eligible for citizenship in Germany; it varies between 8 and 16 years (see Table 1 and Figure 2). All specifications include in addition year of arrival and year of birth fixed effects, current year and state fixed effects, state-specific linear trends and ten region of origin fixed effects (traditional EU countries, new EU entrants (EU-12), ex-Yugoslavia, Turkey, Middle East, Asia, Africa, North and South America, Russia and other former Soviet Union republics, other or no citizenship). Standard errors in brackets are clustered by age x arrival year. Statistical significance: *** p<0.01, ** p<0.05, * p<0.1.

Source: Microcensus (2005-2010).

Table 4: Naturalization, Eligibility and Social Assistance

	<u>Men</u>		<u>Women</u>	
	<u>Any Social Assistance</u>		<u>Any Social Assistance</u>	
	OLS Estimates (1)	RF Estimates (2)	OLS Estimates (3)	RF Estimates (4)
Naturalized	-0.038*** [0.006]		-0.014** [0.006]	
Residency Requirement (in years)		-0.001 [0.002]		-0.001 [0.002]
Observations	18,972	18,972	19,119	19,119
R Squared	0.078	0.076	0.050	0.050
Mean of Dependent Variable	0.148	0.148	0.106	0.106
	<u>Welfare (=1) or UI Benefits (=0)</u>		<u>Welfare (=1) or UI Benefits (=0)</u>	
Conditional on Social Assistance	OLS Estimates (5)	RF Estimates (6)	OLS Estimates (7)	RF Estimates (8)
Naturalized	-0.035* [0.019]		-0.058*** [0.019]	
Residency Requirement (in years)		-0.009 [0.006]		-0.003 [0.006]
Observations	2,688	2,688	2,008	2,008
R Squared	0.109	0.109	0.123	0.119
Mean of Dependent Variable	0.767	0.767	0.835	0.835
Years in Germany and Age Polynomials	Yes	Yes	Yes	Yes
Cohort of Arrival Fixed Effects	Yes	Yes	Yes	Yes
Year of Birth Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Region of Origin Fixed Effects	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes
State-specific Linear Trends	Yes	Yes	Yes	Yes

Notes : The table reports estimates of the link between citizenship and welfare dependency. The dependent variable in the top panel is an indicator equal to one if a person receives any welfare benefits, i.e. unemployment benefits (Arbeitslosengeld I) or social assistance (Arbeitslosengeld II). In the bottom panel, the dependent variable is an indicator equal to one if an immigrant receives welfare benefits and zero if she receives unemployment benefits. Odd columns show OLS estimates of the relationship between actual naturalization and welfare dependency; even columns show reduced form estimates of how the residency requirement affects welfare dependency. The residency requirement denotes the number of years an immigrant has to wait before becoming eligible for German citizenship. The sample includes all immigrants who arrived in Germany between 1975 and 2002 and were between 0 and 22 years old when they arrived in Germany. We exclude ethnic Germans, i.e. immigrants with German ancestry who had faster access to German citizenship than regular immigrants. All specifications include the same controls as earlier tables (year of arrival and year of birth fixed effects, a second-order polynomial of years in Germany and age), year and state fixed effects, state-specific linear trends and ten region of origin fixed effects (traditional EU countries, new EU entrants (EU-12), ex-Yugoslavia, Turkey, Middle East, Asia, Africa, North and South America, Russia and other former Soviet Union republics, other or no citizenship). Standard errors in brackets are clustered by age x arrival year. Statistical significance: *** p<0.01, ** p<0.05, * p<0.1.

Source : Microcensus (2005-2010).

Table 5: Alternative Specifications

Men	Log Personal Income (Reduced Form Estimates)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Residency Requirement (in years)	-0.003 [0.004]	-0.003 [0.004]	-0.003 [0.004]	-0.003 [0.004]	-0.003 [0.004]	-0.003 [0.004]	-0.003 [0.004]	-0.002 [0.004]	-0.003 [0.004]	-0.003 [0.005]	-0.002 [0.004]	-0.001 [0.004]
Years in Germany Polynomial	Linear	Quadratic	Cubic	Quartic	Quadratic	Quadratic	Quadratic	Quadratic	Quadratic	Quadratic	Quadratic	Quadratic
Age Polynomial	Quadratic	Quadratic	Quadratic	Quadratic	Linear	Quadratic	Cubic	Quartic	Quadratic	Quadratic	Quadratic	Quadratic
Age of Arrival Controls	No	No	No	No	No	No	No	No	Before 11	Arrived >8	No	No
Birth Cohort FE * Before/After 1990	No	No	No	No	No	No	No	No	No	No	Yes	No
Birth Cohort * Arrival Cohort (grouped)	No	No	No	No	No	No	No	No	No	No	No	Yes
Cohort of Arrival Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year of Birth Ficed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region of Origin Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State-specific Linear Trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12,351	12,351	12,351	12,351	12,351	12,351	12,351	12,351	12,351	10,393	12,351	12,351
R Squared	0.367	0.367	0.368	0.368	0.362	0.367	0.370	0.370	0.368	0.256	0.368	0.369
AIC criterion	18921.9	18923.2	18922.9	18922.5	19022.12	18877.0	18879.46	18921.21				
Women	Log Personal Income (Reduced Form Estimates)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Residency Requirement (in years)	-0.016*** [0.005]	-0.016*** [0.005]	-0.016*** [0.005]	-0.016*** [0.005]	-0.016*** [0.005]	-0.016*** [0.005]	-0.016*** [0.005]	-0.016*** [0.005]	-0.016*** [0.005]	-0.013** [0.007]	-0.015*** [0.005]	-0.015*** [0.005]
Years in Germany Polynomial	Linear	Quadratic	Cubic	Quartic	Quadratic	Quadratic	Quadratic	Quadratic	Quadratic	Quadratic	Quadratic	Quadratic
Age Polynomial	Quadratic	Quadratic	Quadratic	Quadratic	Linear	Quadratic	Cubic	Quartic	Quadratic	Quadratic	Quadratic	Quadratic
Age of Arrival Controls	No	No	No	No	No	No	No	No	Before 11	Arrived >8	No	No
Birth Cohort FE * Before/After 1990	No	No	No	No	No	No	No	No	No	No	Yes	No
Birth Cohort * Arrival Cohort (grouped)	No	No	No	No	No	No	No	No	No	No	No	Yes
Cohort of Arrival Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year of Birth Ficed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region of Origin Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State-specific Linear Trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9,469	9,469	9,469	9,469	9,469	9,469	9,469	9,469	9,469	7,792	9,469	9,469
R Squared	0.109	0.109	0.109	0.109	0.108	0.109	0.111	0.111	0.109	0.084	0.109	0.113
AIC criterion	19679.8	19681.1	19689.1	19684.5	19693.2	19667.1	19664.6	19681.1				

Notes : The table reports reduced-form estimates of the relationship between the residency requirement and log monthly earnings (adjusted to 2005 prices) for immigrant men (top panel) and women (bottom panel) in Germany. The first four specifications (columns (1)-(4)) include a first-order up to a fourth-order polynomial in years in Germany. Columns (5)-(8) include a first- up to a fourth-order polynomial in age. Column (9) controls for age of arrival by a dummy variable equal to one if an immigrant arrived in Germany before the age of 11. Column (10) restricts the sample to immigrants arriving in Germany after age 8. Column (11) allows for separate birth year fixed effects for arrival cohorts prior to 1990 and those arriving after 1990. Column (12) allows birth cohort effects to vary across 5-year arrival groups. The sample includes all immigrants who arrived in Germany between 1975 and 2002 and were between 0 and 22 years old when they arrived in Germany. We exclude ethnic Germans, i.e. immigrants with German ancestry who had faster access to German citizenship than regular immigrants. All specifications also include the same variables as in Table 3. Standard errors in brackets are clustered by age x arrival year. Statistical significance: *** p<0.01, ** p<0.05, * p<0.1.

Source : Microcensus (2005-2010)

Table 6: Heterogeneity in Employment Responses among Women

	<u>Baseline</u>	<u>Differential Year-of-Birth Effects</u>		<u>Employment</u>	<u>Surprised by</u>	<u>Surprised by</u>
	(1)	(2)	(3)	(attached)	Reforms = 1	Reforms = 0
	(1)	(2)	(3)	(4)	(5)	(6)
Residency Requirement (in years)	-0.008*** [0.003]	-0.008*** [0.003]	-0.008*** [0.003]	0.002 [0.002]	-0.003 [0.005]	-0.010** [0.004]
Years in Germany Polynomial	Quadratic	Quadratic	Quadratic	Quadratic	Quadratic	Quadratic
Age Polynomial	Quadratic	Quadratic	Quadratic	Quadratic	Quadratic	Quadratic
Birth Cohort FE * Before/After 1990	No	Yes	No	No	No	No
Birth Cohort * Arrival Cohort (grouped)	No	No	Yes	No	No	No
Cohort of Arrival Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year of Birth Ficed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Region of Origin Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
State-specific Linear Trends	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,119	19,119	19,119	18,310	11,959	7,166
R Squared	0.123	0.123	0.124	0.209	0.104	0.164

Notes : The table reports reduced-form estimates of the effects of the residency requirement on female employment. The sample includes all immigrants who arrived in Germany between 1975 and 2002 and were between 0 and 22 years old when they arrived in Germany. We exclude ethnic Germans, i.e. immigrants with German ancestry who had faster access to German citizenship than regular immigrants. The residency requirement denotes the number of years an immigrant has to wait before becoming eligible for German citizenship after the 1991 or 2000 immigration reforms. Column (1) reports the baseline estimate from Table 3, column (7). Column (2) allows the year of birth pattern to vary for cohorts arriving before and those arriving after 1990. Column (3) allows separate year of birth fixed effects by 5-year arrival cohorts. Column (4) restricts the sample to women who have worked before. Columns (5) and (6) report separate estimates for immigrants who get surprised by the reforms (and hence, face a shorter waiting period than they initially expected) and immigrants who knew their actual residency requirement respectively. In addition, all specifications include year of arrival and year of birth fixed effects, current year and state fixed effects, state-specific linear trends and ten region of origin fixed effects (traditional EU countries, new EU entrants (EU-12), ex-Yugoslavia, Turkey, Middle East, Asia, Africa, North and South America, Russia and other former Soviet Union republics, other or no citizenship). Standard errors in brackets are clustered by age x arrival year. Statistical significance: *** p<0.01, ** p<0.05, * p<0.1.

Source : Microcensus (2005-2010).

Table 7: Changes in Labor Supply or Productivity?

	<u>Men</u>				<u>Women</u>			
	<u>Weekly Earnings</u>	<u>Working hours</u>	<u>Fulltime Work</u>	<u>Job Tenure</u>	<u>Weekly Earnings</u>	<u>Working hours</u>	<u>Fulltime Work</u>	<u>Job Tenure</u>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Residency Requirement (in years)	-0.009** [0.004]	0.189*** [0.069]	0.001 [0.002]	-0.149*** [0.038]	0.004 [0.005]	-0.395*** [0.101]	-0.014*** [0.004]	-0.087** [0.034]
Years in Germany	-0.004 [0.014]	0.131 [0.284]	0.010 [0.008]	0.073 [0.153]	0.001 [0.018]	0.707* [0.405]	0.012 [0.014]	0.068 [0.141]
Years in Germany ²	0.000 [0.000]	-0.003 [0.007]	-0.000 [0.000]	0.003 [0.004]	-0.000 [0.000]	-0.005 [0.010]	0.000 [0.000]	0.000 [0.004]
Age	0.190*** [0.023]	0.590 [0.428]	0.010 [0.014]	-0.246 [0.180]	0.179*** [0.027]	-0.699 [0.552]	-0.020 [0.019]	-0.278* [0.162]
Age ²	-0.002*** [0.000]	-0.007 [0.006]	-0.000 [0.000]	0.001 [0.003]	-0.002*** [0.000]	0.005 [0.008]	0.000 [0.000]	0.005* [0.003]
Cohort of Arrival Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year of Birth Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region of Origin Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State-specific Linear Trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12,351	12,351	12,351	11,892	9,469	9,469	9,469	9,088
R Squared	0.275	0.058	0.077	0.361	0.13	0.087	0.104	0.22
Mean of Dependent Variable	3.57	38.32	0.88	6.69	3.39	27.88	0.48	4.98

Notes : The table reports reduced-form estimates of the effects of the residency requirement for immigrant men (left-hand side) and women (right-hand side) in Germany. The dependent variables are log weekly labor market income (in columns (1) and (5)); working hours per week (in columns (2) and (6)); whether an immigrant is employed full-time, i.e. more than 30 hours per week (in columns (3) and (7)); and the number of years working at the same employer (in columns (4) and (8)). The sample includes all immigrants who arrived in Germany between 1975 and 2002 and who were between 0 and 22 years old when they arrived in Germany. We exclude ethnic Germans, i.e. immigrants with German ancestry who had faster access to German citizenship than regular immigrants. The residency requirement denotes the number of years an immigrant has to wait before becoming eligible for German citizenship after the 1991 or 2000 immigration reforms. All specifications include in addition year of arrival and year of birth fixed effects, current year and state fixed effects, state-specific linear trends and ten region of origin fixed effects (traditional EU countries, new EU entrants (EU-12), ex-Yugoslavia, Turkey, Middle East, Asia, Africa, North and South America, Russia and other former Soviet Union republics, other or no citizenship). Standard errors in brackets are clustered by age x arrival year. Statistical significance: *** p<0.01, ** p<0.05, * p<0.1.

Source : Microcensus (2005-2010).

Table 8: Citizenship Eligibility and Investments in Education

	<u>Men</u>				<u>Women</u>			
	<u>Low-skilled</u>	<u>Medium-skilled</u>	<u>High-skilled</u>	<u>In School</u>	<u>Low-skilled</u>	<u>Medium-skilled</u>	<u>High-skilled</u>	<u>In School</u>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Residency Requirement (in years)	0.009*** [0.003]	-0.011*** [0.002]	0.002 [0.002]	-0.001 [0.002]	0.003** [0.001]	-0.007*** [0.002]	0.002 [0.002]	0.003 [0.002]
Years in Germany	-0.001 [0.012]	-0.015 [0.010]	-0.002 [0.005]	0.019** [0.007]	-0.015 [0.012]	-0.000 [0.009]	-0.002 [0.005]	0.017** [0.007]
Years in Germany ²	-0.000 [0.000]	0.001*** [0.000]	0.000 [0.000]	-0.000*** [0.000]	0.000 [0.000]	0.000* [0.000]	0.000 [0.000]	-0.001*** [0.000]
Age	0.105*** [0.018]	0.093*** [0.013]	0.016*** [0.005]	-0.215*** [0.012]	0.141*** [0.017]	0.067*** [0.012]	0.002 [0.005]	-0.211*** [0.011]
Age ²	-0.002*** [0.000]	-0.001*** [0.000]	-0.000 [0.000]	0.003*** [0.000]	-0.002*** [0.000]	-0.001*** [0.000]	0.000 [0.000]	0.003*** [0.000]
Years in Germany and Age Polynomials	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort of Arrival Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year of Birth Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region of Origin Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State-specific Linear Trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	18,983	18,983	18,983	18,983	19,125	19,125	19,125	19,125
R Squared	0.098	0.156	0.063	0.648	0.179	0.174	0.061	0.640
Mean of Dependent Variable	0.454	0.432	0.058	0.056	0.519	0.374	0.056	0.050

Notes : The table reports reduced-form estimates of the residency requirement and educational investments for immigrant men (left-hand side) and women (right-hand side). The dependent variables are binary indicators equal to one if an immigrant is low skilled (has no high school or vocational degree), medium-skilled (has a high school degree or vocational degree), high-skilled (has a university or college degree) or in school (is currently attending general or vocational school). The sample includes all immigrants who arrived in Germany between 1975 and 2002 and were between 0 and 22 years old when they arrived in Germany. We exclude ethnic Germans, i.e. immigrants with German ancestry who had faster access to German citizenship than regular immigrants. The residency requirement denotes the number of years an immigrant has to wait before becoming eligible for German citizenship after the 1991 and 2000 immigration reforms. All specifications include a second-order polynomial in current age and years in Germany, year of arrival and year of birth fixed effects, current year and state fixed effects, state-specific linear trends and ten region of origin fixed effects (traditional EU countries, new EU entrants (EU-12), ex-Yugoslavia, Turkey, Middle East, Asia, Africa, North and South America, Russia and other former Soviet Union republics, other or no citizenship). Standard errors in brackets are clustered by age x arrival year. Statistical significance: *** p<0.01, ** p<0.05, * p<0.1.

Source : Microcensus (2005-2010)

Table 9: Eligibility for Citizenship and Language Skills

	<u>Men</u>		<u>Women</u>	
	<u>Speak German</u>	<u>Write German</u>	<u>Speak German</u>	<u>Write German</u>
	(1)	(2)	(3)	(4)
Residency Requirement (in years)	-0.018** [0.008]	-0.015** [0.008]	-0.014* [0.007]	-0.010 [0.008]
Years in Germany	0.057*** [0.010]	0.059*** [0.011]	0.046*** [0.010]	0.058*** [0.011]
Years in Germany ²	-0.000 [0.000]	-0.001** [0.000]	-0.000 [0.000]	-0.001** [0.000]
Age	-0.029** [0.014]	-0.021* [0.012]	-0.047*** [0.012]	-0.048*** [0.013]
Age ²	-0.000 [0.000]	-0.000* [0.000]	-0.000 [0.000]	-0.000 [0.000]
Cohort of Arrival Fixed Effects	Yes	Yes	Yes	Yes
Year of Birth Fixed Effects	Yes	Yes	Yes	Yes
Region of Origin Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes
State-specific Linear Trends	Yes	Yes	Yes	Yes
Observations	2,019	1,942	2,159	2,015
R Squared	0.289	0.298	0.378	0.328
Mean of Dependent Variable	0.300	0.383	0.334	0.409

Notes : The table reports reduced-form estimates of the link between the waiting period and language skills for immigrant men (left-hand side) and women (right-hand side) in Germany. The dependent variables are binary indicators for self-assessed language skills in writing and speaking German (1 = speak/write well or very well, 0 = not at all, bad or fair speaking/writing skills). The sample includes all immigrants who arrived in Germany between 1975 and 2002 and who were between 0 and 22 years old when they arrived in Germany. The residency requirement denotes the number of years an immigrant has to wait before becoming eligible for German citizenship after the 1991 and 2000 immigration reforms. All specifications include in addition cohort of arrival and year of birth fixed effects, current year and state of current residence fixed effects, state-specific linear trends and ten region of origin fixed effects (traditional EU countries, new EU entrants (EU-12), ex-Yugoslavia, Turkey, Middle East, Asia, Africa, North and South America, Russia and other former Soviet Union republics, other or no citizenship). Standard errors in brackets are clustered by age x arrival year. Statistical significance: *** p<0.01, ** p<0.05, * p<0.1.

Source : Socio-Economic Panel (1984-2009).

Table 10: Eligibility for Citizenship and Job Characteristics

	Men				Women			
	<u>Public Sector</u>	<u>White-Collar</u>	<u>Self-</u>	<u>Temporary</u>	<u>Public Sector</u>	<u>White-Collar</u>	<u>Self-</u>	<u>Temporary</u>
	<u>Job</u>	<u>Job</u>	<u>Employment</u>	<u>Contract</u>	<u>Job</u>	<u>Job</u>	<u>Employment</u>	<u>Contract</u>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Residency Requirement (in years)	-0.004*** [0.001]	-0.006 [0.004]	0.005** [0.002]	0.001 [0.002]	0.002 [0.002]	-0.013*** [0.004]	0.003 [0.002]	0.006** [0.003]
Years in Germany and Age Polynomials	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort of Arrival Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year of Birth Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region of Origin Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State-specific Linear Trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12,349	10,152	12,351	11,007	9,467	8,024	9,469	8,716
R Squared	0.014	0.109	0.066	0.26	0.021	0.182	0.044	0.201
Mean of Dependent Variable	0.050	0.366	0.104	0.184	0.113	0.591	0.065	0.212

Notes: The table reports reduced form estimates of how the residency requirement affects job characteristics for immigrant men (left-hand side) and women (right-hand side) in Germany. The dependent variables are whether a person is employed in the public sector (columns (1) and (5)); whether a person works in a white-collar job (columns (2) and (6)); whether a person is self-employed (columns (3) and (7)); and whether a person has a temporary employment contract (columns (4) and (8)). The residency requirement denotes the number of years an immigrant has to wait before becoming eligible for German citizenship after the 1991 and 2000 immigration reforms. The sample includes all immigrants who arrived in Germany between 1975 and 2002 and were between 0 and 22 years old when they arrived in Germany. We exclude ethnic Germans, i.e. immigrants with German ancestry who had faster access to German citizenship than regular immigrants. All specifications include a second-order polynomial of years in Germany and current age, year of arrival and year of birth fixed effects, current year and state fixed effects, state-specific linear trends and ten region of origin fixed effects (traditional EU countries, new EU entrants (EU-12), ex-Yugoslavia, Turkey, Middle East, Asia, Africa, North and South America, Russia and other former Soviet Union republics, other or no citizenship). Standard errors in brackets are clustered by age x arrival year. Statistical significance: *** p<0.01, ** p<0.05, * p<0.1.
Source: Microcensus (2005-2010).

Table A1: Summary Statistics of the Microcensus

	<u>Men</u>		<u>Women</u>	
	Mean	Std. Dev.	Mean	Std. Dev.
Year of Arrival	1989	6.360	1990	6.205
Birth Year	1976	8.337	1976	7.787
Years in Germany	18.401	6.381	17.519	6.200
Age	30.958	8.339	30.907	7.805
Naturalized	0.381	0.486	0.372	0.483
Years since Naturalized	3.659	6.140	3.730	6.306
Residency Requirement	10.724	2.838	10.495	2.780
Year first Eligible for Citizenship	2000	4.597	2000	4.428
Employment	0.711	0.453	0.524	0.499
Employment (if ever employed)	0.840	0.367	0.716	0.451
Log Personal Income	7.156	0.649	6.536	0.717
Log Weekly Income	3.573	0.605	3.388	0.659
Working Hours	38.321	10.856	27.876	13.774
Full-time Work	0.875	0.330	0.484	0.500
Job Tenure	6.687	6.602	4.983	5.102
Public Sector Employment	0.050	0.219	0.113	0.317
White-Collar Job	0.366	0.482	0.591	0.492
Self-Employed	0.104	0.305	0.065	0.247
Temporary Work Contract	0.184	0.387	0.212	0.409
Receive Transfers (Unemployment or Welfare)	0.148	0.355	0.106	0.307
Type of Benefits Received (1= Welfare Benefits)	0.767	0.423	0.835	0.372
Low-skilled	0.454	0.498	0.519	0.500
Medium-skilled	0.432	0.495	0.374	0.484
High-skilled	0.058	0.233	0.056	0.230
In School or Training	0.056	0.230	0.050	0.218
<u>Region of origin</u>				
Traditional EU member states (EU 15)	0.138	0.345	0.115	0.319
New EU Member States (EU 12)	0.089	0.284	0.131	0.338
Ex-Yugoslavia	0.128	0.334	0.116	0.320
Turkey	0.324	0.468	0.333	0.471
Middle East	0.091	0.288	0.070	0.256
Africa	0.048	0.214	0.038	0.192
Asia	0.050	0.218	0.058	0.234
North and South America	0.016	0.125	0.019	0.138
Former Soviet Union (without EU12)	0.098	0.298	0.104	0.305
Other or No Citizenship	0.018	0.132	0.015	0.121
Source Country GDP per capita	9357.8	7575.6	9036.8	7035.4
Observations	18,983		19,125	

Notes : The table shows summary statistics for the sample of first-generation immigrants who arrived in Germany between 1975 and 2002 and were between 0 and 22 years old when they arrived in Germany. Ethnic Germans are excluded from the sample. Data for personal income, public sector and white-collar employment are only available for the subsample of employed individuals; GDP per capita in the country of origin (measured in 2005 US dollars) is only available for immigrants of which we know the country of origin rather than only the region of origin. Low-skilled are those without high school degree or vocational degree; medium-skilled individuals are those with a high school or vocational degree; high-skilled are those with a college degree; and those in school attend general or vocational school at the time of the interview.

Source : Microcensus (2005-2010); Penn World Tables (2011).

Table A2: Summary Statistics of the Socio-Economic Panel

	<u>Men</u>		<u>Women</u>	
	Mean	Std. Dev.	Mean	Std. Dev.
Year of Arrival	1985	6.01	1986	5.95
Birth Year	1973	7.29	1973	7.25
Years in Germany	16.31	5.54	15.86	5.36
Age	28.23	6.70	28.46	6.62
Naturalized	0.45	0.50	0.49	0.50
Eligible	1996	4.29	1996	4.34
Residency Requirement	11.19	2.79	11.08	2.77
Speak German Well or Very Well	0.30	0.46	0.33	0.47
Write in German Well or Very Well	0.38	0.49	0.41	0.49
Low-skilled	0.32	0.47	0.44	0.50
Medium-skilled	0.42	0.49	0.33	0.47
High-skilled	0.04	0.19	0.05	0.21
In School or Training	0.22	0.41	0.19	0.39
<u>Region of origin</u>				
Traditional EU Member Countries (EU 15)	0.10	0.30	0.13	0.33
New EU Member Countries (EU 12)	0.17	0.38	0.21	0.41
Ex-Yugoslavia	0.10	0.30	0.08	0.27
Turkey	0.39	0.49	0.33	0.47
Middle East	0.02	0.14	0.01	0.10
Africa	0.01	0.09	0.00	0.06
Asia	0.00	0.06	0.01	0.09
North and South America	0.01	0.12	0.02	0.15
Former Soviet Union (without EU 12)	0.19	0.39	0.21	0.41
Other or no Citizenship	0.00	0.05	0.00	0.05
Observations	4,274		4,690	

Notes: The table reports summary statistics for first-generation immigrants who are not ethnic Germans, arrived in Germany between 1975 and 2002 and who were between 0 and 22 years old when they arrived in Germany. We code the self-reported language abilities (ranging from 0 = not at all to 4 = very well) into binary indicators equal to one if a person speaks (writes) German well or very well and zero otherwise. Naturalized is equal to one if a person is actually naturalized. Eligibility is coded as described in the main text. Low-skilled individuals are those without a high school or vocational degree; medium-skilled are those with high school or vocational degree; high-skilled are those with college degree. Individuals are in school or training if they still attend a general or vocational school.

Source: Socio-Economic Panel (1984-2009)

Table A3: Alternative Specifications for Educational Investments

<u>Y: Medium-skilled</u>	<u>Men</u>				<u>Women</u>			
	<u>Baseline</u>	<u>Differential</u>	<u>Year-of-Birth</u>	<u>Expected-</u>	<u>Baseline</u>	<u>Differential</u>	<u>Year-of-Birth</u>	<u>Expected-</u>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Residency Requirement (in years)	-0.011*** [0.002]	-0.013*** [0.003]	-0.010*** [0.003]		-0.007*** [0.002]	-0.009*** [0.002]	-0.008*** [0.002]	
Eligible in t+1 or t+2								
D(Expected -Actual Waiting Period>0)				-0.079*** [0.019]				-0.101*** [0.016]
Years in Germany Polynomial	Quadratic	Quadratic	Quadratic	Quadratic	Quadratic	Quadratic	Quadratic	Quadratic
Age Polynomial	Quadratic	Quadratic	Quadratic	Quadratic	Quadratic	Quadratic	Quadratic	Quadratic
Birth Cohort FE * Before/After 1990	No	Yes	No	No	No	Yes	No	No
Birth Cohort * Arrival Cohort (grouped)	No	No	Yes	No	No	No	Yes	No
Cohort of Arrival Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year of Birth Ficed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region of Origin Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State-specific Linear Trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	18,983	18,983	18,983	18,983	19,125	19,125	19,125	19,125
R Squared	0.156	0.157	0.159	0.156	0.174	0.185	0.187	0.186

Notes : The table reports reduced-form estimates of the effects of the residency requirement on the probability of being medium-skilled. The sample includes all immigrants who arrived in Germany between 1975 and 2002 and were between 0 and 22 years old when they arrived in Germany. We exclude ethnic Germans, i.e. immigrants with German ancestry who had faster access to German citizenship than regular immigrants. The residency requirement denotes the number of years an immigrant has to wait before becoming eligible for German citizenship after the 1991 or 2000 immigration reforms. Columns (1) and (5) report the baseline estimate from Table 8, columns (2) and (6). Columns (2) and (6) allow the year of birth pattern to vary for cohorts arriving before and those arriving after 1990. Columns (3) and (7) allow separate year of birth fixed effects by 5-year arrival cohorts. Columns (4) and (8) use an indicator variable equal to one if the expected waiting period exceeds the actual waiting period for citizenship. The indicator is zero if the expected is equal to the actual waiting period. In addition, all specifications include year of arrival and year of birth fixed effects, current year and state fixed effects, state-specific linear trends and ten region of origin fixed effects (traditional EU countries, new EU entrants (EU-12), ex-Yugoslavia, Turkey, Middle East, Asia, Africa, North and South America, Russia and other former Soviet Union republics, other or no citizenship). Standard errors in brackets are clustered by age x arrival year. Statistical significance: *** p<0.01, ** p<0.05, * p<0.1.

Source : Microcensus (2005-2010).

Table A4: Evolution of Pre-Determined Characteristics and Lee Bounds on the Average Treatment Effect

Arrival Cohort	Mean Age			Turkey			Ex-Yugoslavia			EU-15 Member States		
	2005 (1)	2010 (2)	T-Statistic (3)	2005 (4)	2010 (5)	T-Statistic (6)	2005 (7)	2010 (8)	T-Statistic (9)	2005 (10)	2010 (11)	T-Statistic (12)
1975-1979	36.49	41.69	-0.42	0.652	0.648	0.09	0.082	0.073	0.45	0.131	0.125	0.22
1980-1984	35.35	40.73	-0.92	0.484	0.482	0.07	0.065	0.076	-0.68	0.172	0.157	0.62
1985-1989	30.33	35.18	0.44	0.385	0.373	0.56	0.077	0.099	-1.61	0.162	0.129	1.98
1990-1994	26.05	31.14	-0.33	0.274	0.260	0.79	0.192	0.246	-3.21	0.108	0.076	2.72
1995-1999	22.80	27.86	-0.19	0.239	0.249	-0.46	0.082	0.125	-2.56	0.104	0.087	1.11

Log Personal Income	No trimming				Trimming (Attrition lower for control group)				Trimming (Attrition lower for treated group)			
	Men		Women		Men		Women		Men		Women	
	Coeff.	S.E.	Coeff.	S.E.	Lower B.	Upper B.	Lower B.	Upper B.	Lower B.	Upper B.	Lower B.	Upper B.
Treat = 1 if Eligible after 8 Yrs (=0 if more than 8 years)	0.008	[0.018]	0.075***	[0.026]	-0.013	0.044	0.031	0.087	-0.047	0.030	0.044	0.107

Notes : The top panel shows several characteristics of 5-year arrival cohorts in 2005 and 2010: mean age (columns (1)-(2)); the share of immigrants from Turkey (column (4)-(5)); the share from successor states of Yugoslavia (columns (7)-(8)); and the share from the traditional 15 EU member states (columns (10)-(11)). The T-statistic in column (3) tests for each 5-year arrival cohort the hypothesis that the mean age in 2005 is equal to the mean age in 2010 plus 5. The T-statistic in columns (6), (9) and (12) test for each 5-year arrival cohort the hypotheses that the share of immigrants from the source countries (shown in the top row) do not change between 2005 and 2010. The bottom panel estimates bounds on the treatment effect following Lee (2009). The binary treatment variable is equal to one if an immigrant faces an 8-year residency requirement; and zero if an immigrant faces a longer residency requirement. Columns (1)-(4) estimate equation (2) using the binary treatment variable. Columns (5)-(8) estimate the lower and upper bound on the average treatment effect under the assumption that older immigrants are less likely to return. To obtain the trimming margin, we use the mean age difference between treatment and control group (29.2 and 34.8 years-old for a difference of 5.6 years) and estimates from Dustmann (2003, Table 6) to obtain an excess attrition in the treatment group of 3.2%. Trimming the outcome variable for the control group from above, we obtain the lower bound; trimming the outcome variable at the bottom, we obtain the upper bound. In columns (9)-(12), we use the same bounds approach under the alternative assumption that the treated group is less likely to return (possibly because of the faster access to citizenship). Using the same trimming margin of 3.2%, we again calculate the upper and lower bounds on the average treatment effect. All estimates in the bottom panel include the same control variables as in the main tables.

Source : Microcensus (2005-2010).

Table A5: Return Migration and Other Selective Dropout of Immigrants

	Men				Women			
	<u>Exit from Population</u>				<u>Exit from Population</u>			
	(Emigration or Mortality)				(Emigration or Mortality)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Eventually Naturalized	-0.002 [0.004]				-0.003 [0.003]			
Actually Naturalized		-0.012 [0.008]				-0.004 [0.004]		
Eligible for Naturalization			0.004 [0.007]				0.004 [0.007]	
Residency Requirement				-0.000 [0.002]				-0.002 [0.001]
Years in Germany	0.001 [0.002]	0.001 [0.002]	-0.002 [0.003]	0.001 [0.002]	-0.002 [0.001]	-0.002 [0.001]	-0.003 [0.002]	-0.001 [0.001]
Years in Germany ²	-0.000 [0.000]	-0.000 [0.000]	0.000 [0.000]	-0.000 [0.000]	0.000 [0.000]	0.000 [0.000]	0.000 [0.000]	0.000 [0.000]
Age	0.003 [0.002]	0.003 [0.002]	0.004* [0.002]	0.003 [0.002]	0.003** [0.002]	0.003** [0.002]	0.004** [0.002]	0.004** [0.002]
Age ²	-0.000 [0.000]	-0.000 [0.000]	-0.000 [0.000]	-0.000 [0.000]	-0.000** [0.000]	-0.000** [0.000]	-0.000** [0.000]	-0.000** [0.000]
Cohort of Arrival Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year of Birth Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region of Origin Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State-specific Linear Trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,446	4,446	4,374	4,446	4,875	4,875	4,790	4,875
R Squared	0.036	0.037	0.035	0.036	0.040	0.040	0.041	0.040

Notes: The dependent variable is the probability that an immigrant exits from the population (either through mortality or leaving the sample, e.g. by moving abroad). The key independent variables are whether an immigrant eventually naturalizes while participating in the SOEP (columns (1) and (5)); whether the immigrant is currently naturalized (columns (2) and (6)); whether the immigrant is currently eligible for citizenship (columns (3) and (7)); and the residency requirement an immigrant faces (columns (4) and (8)). The sample and specification are the same as in Table 9. Standard errors in brackets are clustered by age x arrival year. Statistical significance: *** p<0.01, ** p<0.05 and * p<0.1.

Source: Socio-Economic Panel (1984-2009)

Table A6: Alternative Samples and Additional Controls

	<u>Men</u>		<u>Women</u>	
	<u>Employment</u> (1)	<u>Log Personal Income</u> (2)	<u>Employment</u> (3)	<u>Log Personal Income</u> (4)
Drop Immigrants with German Partners	-0.002 [0.003]	-0.007 [0.007]	-0.012*** [0.003]	-0.019** [0.007]
Drop Additional Ethnic Germans	0.003 [0.002]	-0.006 [0.007]	-0.009*** [0.003]	-0.025*** [0.008]
Households with Children 15+ (2000 Reform)	0.003 [0.004]	-0.006 [0.007]	-0.017*** [0.004]	-0.025*** [0.008]
Years before 2000 Reform (SOEP)	-0.002 [0.015]	0.003 [0.014]	-0.017 [0.010]	-0.017** [0.007]
Drop Ex-Yugoslavia and Middle East	0.003 [0.002]	-0.006 [0.007]	-0.004 [0.003]	-0.025*** [0.008]
Rerun for Ex-Yugoslavia and Middle East	-0.003 [0.005]	-0.003 [0.010]	-0.021*** [0.005]	-0.006 [0.013]
Drop East German States	0.002 [0.002]	-0.006 [0.006]	-0.008*** [0.003]	-0.020*** [0.007]
Add Economic Conditions	0.003 [0.002]	-0.005 [0.007]	-0.008*** [0.003]	-0.029*** [0.007]
Drop Arrival Cohorts 1990-2002	0.002 [0.002]	0.002 [0.004]	-0.005 [0.003]	-0.016*** [0.005]
Individual Characteristics	Yes	Yes	Yes	Yes
Years in Germany Polynomial	Yes	Yes	Yes	Yes
Cohort of Arrival Fixed Effects	Yes	Yes	Yes	Yes
Year of Birth Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Region of Origin Fixed Effects	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes
State-specific Linear Trends	Yes	Yes	Yes	Yes

Notes : The table reports reduced-form estimates where the dependent variable is employment (columns (1) and (3)) and log personal income adjusted to 2005 prices (columns (2) and (4)). The key independent variable is the residency requirement for citizenship. The first row drops immigrants with a German spouse in 2005-10; the second row restricts the sample to the 2007-10 Microcensus where we can directly identify and exclude ethnic Germans. The third row drops all households with children under the age of 15 in the household who might have benefitted from the introduction of birthright citizenship in 2000 for all children born on or after January 1, 2000. The fourth row uses SOEP data and years prior to 2000 to rule out that our effects are driven by the introduction of birthright citizenship for newborn children in 2000. The fifth row excludes all immigrants from ex-Yugoslavia and the Middle East, while the sixth row re-estimates the baseline for immigrants from ex-Yugoslavia and the Middle East. The seventh row drops observations from East German states except Berlin, while the eighth row adds labor market controls (a linear and squared term in state unemployment rate and the state GDP growth rate). The final row drops all arrivals since 1990 to reduce the influence of selective outmigration. See notes to previous tables for the definition of the sample. All specifications include the same characteristics as before: a second-order polynomial of years in Germany and age, year of arrival and year of birth fixed effects, state and year fixed effects, state-specific linear time trends and ten region of origin fixed effects. Standard errors in brackets are clustered by age x arrival year. Statistical significance: *** p<0.01, ** p<0.05, * p<0.1. Source : Microcensus (2005-2010).

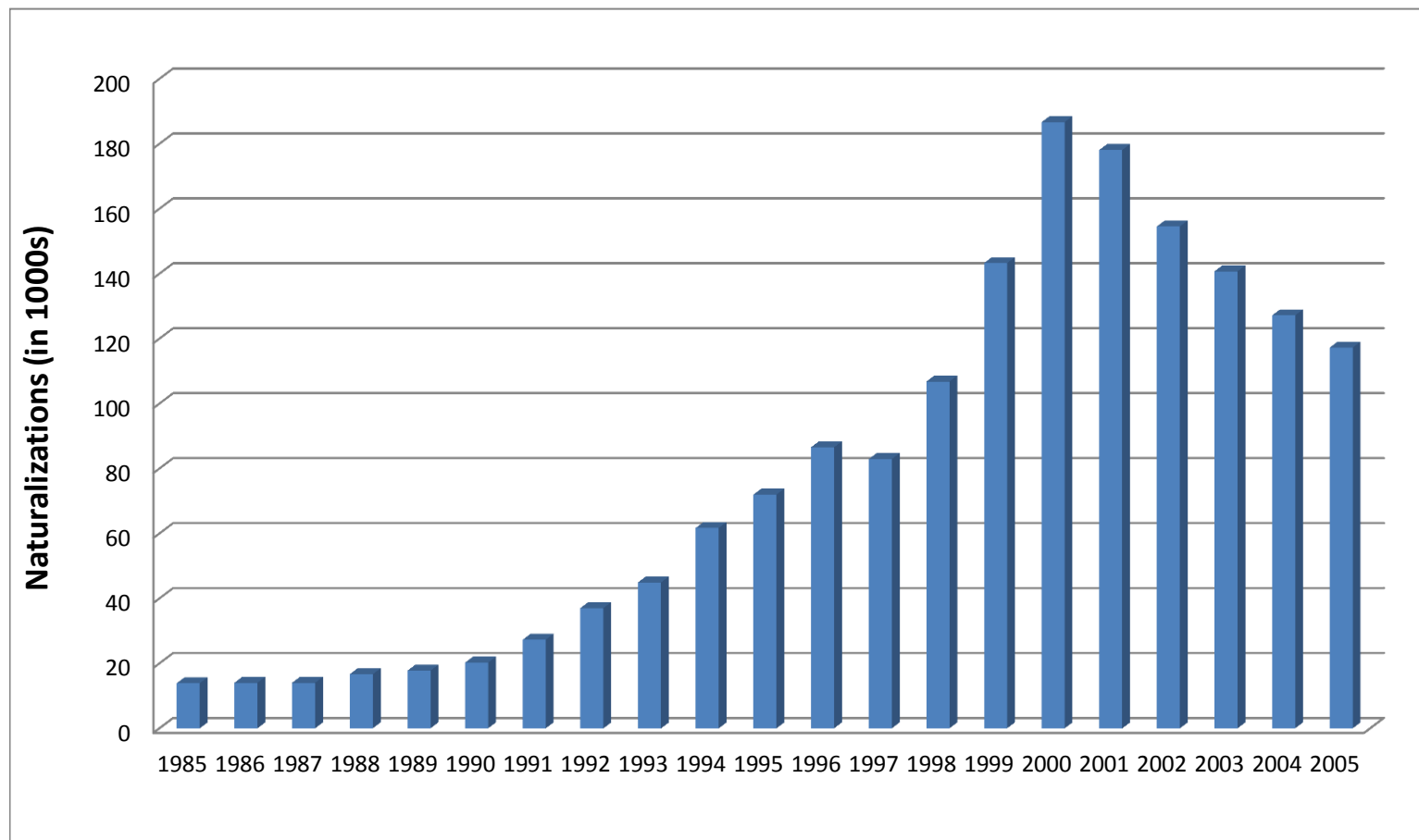
Table A7: Heterogeneity of Returns to Eligibility among Immigrants in Germany

	Men			Women		
	(1) Employment	(2) Hours Worked	(3) Log Monthly Income	(4) Employment	(5) Hours Worked	(6) Log Monthly Income
Residency Requirement (in years)	0.003 [0.003]	0.097 [0.088]	0.002 [0.005]	-0.007** [0.003]	-0.206 [0.136]	0.001 [0.007]
GDP Source Country	-0.000 [0.002]	-0.029 [0.073]	0.009*** [0.003]	0.004* [0.002]	0.230** [0.097]	0.027*** [0.005]
Res. Requirement*GDP Source Country	-0.000 [0.000]	0.008* [0.005]	-0.000* [0.000]	-0.000 [0.000]	-0.022*** [0.008]	-0.002*** [0.000]
Years in Germany and Age Polynomials	Yes	Yes	Yes	Yes	Yes	Yes
Cohort of Arrival Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year of Birth Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Region of Origin Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
State-specific Linear Trends	Yes	Yes	Yes	Yes	Yes	Yes
Observations	15,054	10,331	10,331	16,133	8,154	8,154
R Squared	0.217	0.055	0.362	0.129	0.09	0.116

Notes : The table reports reduced-form estimates of the residency requirement on employment (in columns (1) and (4)), hours worked per week (in columns (2) and (5)) and log monthly personal income adjusted to 2005 prices (in columns (3) and (6)). The sample includes all immigrants who arrived in Germany between 1975 and 2002 and were between 0 and 22 years old when they arrived in Germany. We exclude ethnic Germans, i.e. immigrants with German ancestry who had faster access to German citizenship than regular immigrants. The residency requirement denotes the number of years an immigrant has to wait before becoming eligible for naturalization after the 1991 or 2000 immigration reforms. To study the heterogeneity of effects, we further include the GDP of the source country and the interaction effect of GDP with the residency requirement. All specifications include a second-order polynomial of years in Germany and age, year of arrival and year of birth fixed effects, current year and state of current residence fixed effects, state-specific linear trends and ten region of origin fixed effects (traditional EU countries, new EU entrants (EU-12), ex-Yugoslavia, Turkey, Middle East, Asia, Africa, North and South America, Russia and other former Soviet Union republics, other or no citizenship). Standard errors in brackets are clustered by age x arrival year. Statistical significance: *** p<0.01, ** p<0.05, * p<0.1.

Source : Microcensus (2005-2010); Penn World Tables (2005).

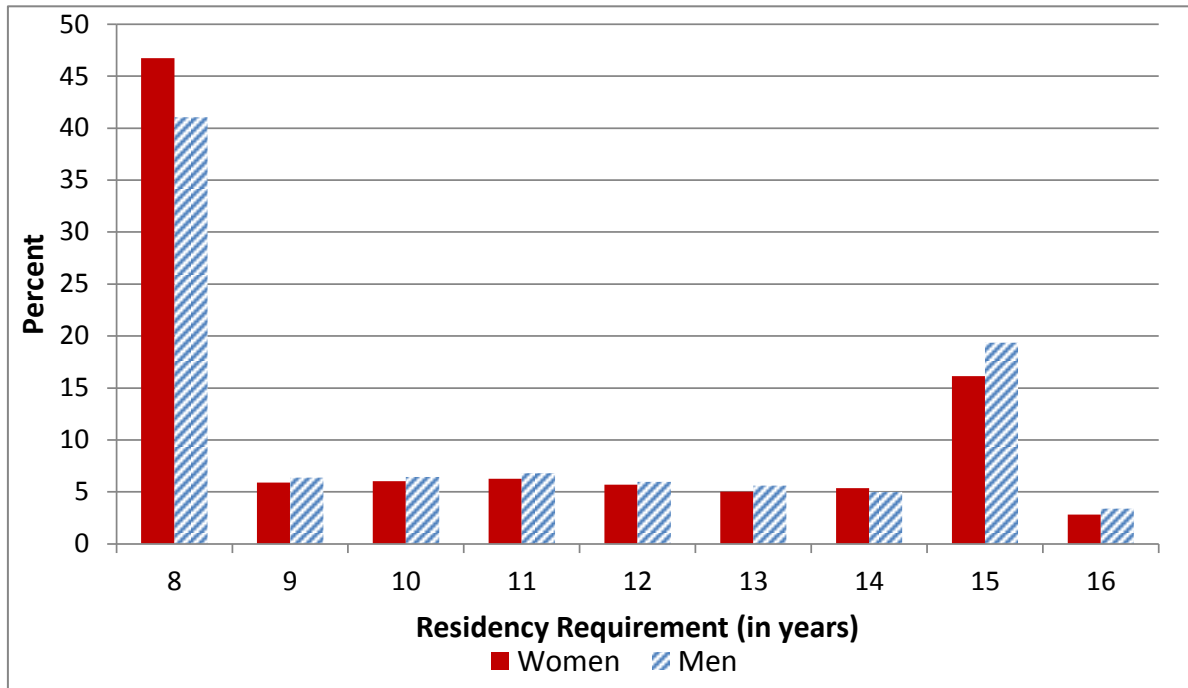
Figure 1: Number of Naturalizations in Germany



Notes : The figure reports the number of naturalizations in Germany (excluding naturalized ethnic Germans); before 1993, the numbers refer to discretionary naturalizations (applications for naturalization based on criteria other than ancestry); after 1993, the numbers refer to naturalizations following the 1991 reform and other discretionary naturalizations. We exclude all naturalizations through a legal claim (based on German ancestry prior to 1990) prior to 1993 and naturalizations based on German ancestry after 1993.

Source : Authors' calculations based on data from the Federal Statistical Office

Figure 2: Variation in Residency Requirements after Reforms



Source : Authors' calculations.