Passport to Progress: The Effects of Birthright Citizenship on Siblings' Education*

Elena Ziege

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Abstract

This paper analyzes family spillovers of birthright citizenship in Germany. By using difference-in-differences and event study methodologies on large-scale survey datasets, I examine the direct impact of citizenship on immigrant children and its spillover effects on the educational achievements of their older siblings who were born before the reform. The findings reveal educational benefits for immigrant children, and positive spillover effects on their older siblings' academic achievements. Children are 13 percentage points more likely, and their older siblings are 6 percentage points more likely, to complete secondary school with the highest degree. The spillovers can be attributed to a considerable increase in parental investments in the siblings' education and increased naturalization of parents and older siblings. Consequently, this study suggests that previous evaluations of citizenship have underestimated its benefits.

Keywords: citizenship, education, siblings, spillover, parental involvement
JEL classification: I21, J15, J24, K37

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1 Introduction

In most OECD countries, the number of immigrant[1] students is steadily growing – in Germany it rose from 13% to 26% over the past decade (OECD, 2022, 2023a). At the same time, immigrant students consistently obtain lower test scores compared with their nonimmigrant peers (at age 15, see OECD, 2023a).[2] The education gap between immigrant and nonimmigrant students is particularly large and persistent in Germany, despite a policy commitment to foster integration[3] since 2005 (Ammermueller, 2007). This disparity is concerning from an integration perspective and might exacerbate skilled-labor shortages. Labor shortages in OECD countries have grown sharply, with talent shortages reported by 75% of firms, up from 30% a decade ago (OECD, 2023b). Implementing policies that promote the educational attainment of immigrant children could increase the availability of skilled labor and alleviate labor shortages. The German government also sees closing immigrant-nonimmigrant education gaps as part of their strategy to tackle the talent shortage (BMAS, 2022).

In recent decades, countries like Germany have reformed their citizenship laws, with more nations adopting birthright citizenship. Globally, 31% of countries grant citizenship at birth, while 8% require a minimum period of parental residence (Gathmann and Garbers, 2023). Research shows that birthright citizenship can improve immigrant children's social integration and educational outcomes. However, less attention has been paid to potential spillover effects on other household members, such as older siblings.

Investigating spillover effects on siblings is crucial for evaluating the costs and benefits of citizenship reforms. As the per-case costs[4] of citizenship are relatively low in Germany – when compared to permanent residency, the counterfactual in this analysis – and are unlikely to exceed the associated benefits, the analysis focuses on assessing the magnitude

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[1]Following the definition provided by PISA, this article uses the term "immigrant children/students" to refer to children whose both parents immigrated to Germany. "Nonimmigrant children/students" refers to children with at least one parent born in Germany.

[2]The gaps hold after accounting for relevant characteristics like the parents' socio-economic status.

[3]"Gesetz zur Steuerung und Begrenzung der Zuwanderung und zur Regelung des Aufenthalts und der Integration von Unionsbürgern und Ausländern" (see SVR, 2018).

[4]Most costs incurred through migration are borne by the state upon the granting of a permanent residence permit. Social benefits, for example, which constitute a major cost factor, can be accessed with a permanent residence permit and, therefore, do not represent additional costs of citizenship. The potential costs of citizenship are linked to the additional benefits mentioned in Section 2 like costs associated with an individual's participation in elections. Additionally, the formal act of naturalization incurs administrative costs.

and nature of those benefits. If citizenship policies that are advantageous for children also benefit their siblings, the policy evaluations would underestimate the benefits. Alternatively, they would overestimate them in the case of negative spillovers on siblings. Investigating spillovers can also enhance our understanding of the mechanisms underlying the effects of citizenship. Older siblings are also an important target population as they can serve as role models for younger siblings and their integration can make the family (economically) more stable.

Several reasons exist why citizenship may impact the older sibling's educational attainment. Citizenship in Germany provides several advantages[5] which are only granted to the focal child, who has received citizenship and do not extend to their siblings – unless they naturalize themselves.[6] First, a child's citizenship could reduce information barriers about citizenship and increase naturalization[7] among parents and siblings. Parents might perceive greater benefits from naturalization once one child is a citizen, prompting them to apply for citizenship themselves and, consequently, for other underage children. Older siblings might also naturalize as adults or their parents might apply for their citizenship via the transition rule.[8] If older siblings are more likely to gain access to citizenship, they may benefit directly like the focal child. This can be seen as a second spillover, as the effect on siblings' citizenship status may have significant additional consequences for their integration and other aspects of their lives.

Second, citizenship may foster family integration and increase the use of German within the household. Avitabile et al. (2013) find that a child's birthright citizenship raises parents' likelihood of interacting with Germans by 14 percentage points and of reading German newspapers by 30 percentage points in the early years after birth. While they do not observe significant changes in language use during this initial period, increased

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[5]These advantages include the right to pursue any profession, including civil service and the ability to work and study visa-free in all European Union (EU) countries (Integrationsbeauftragte, 2023, §9 AufenthG).

[6]Throughout the paper, I will use the term "focal child" to define children born around the citizenship reform in 2000 who were the main targets of the reform. The term "(older) sibling" refers to children in the same household as the focal child who were born before the focal child and before the citizenship reform in 2000.

[7]Naturalization is the legal process by which a non-citizen of a country acquires citizenship of that country.

[8]This transition rule enabled parents to apply for citizenship on the behalf of their children who were born between 1990 and 1999 under the same conditions as the studied birthright citizenship. For more details see Section 2.

interaction and media consumption could impact parents' German proficiency and usage over time. Greater use of German at home may, in turn, enhance older siblings' language skills, potentially benefiting their academic performance.

Third, a child's citizenship might influence parental behavior and resource allocation. Avitabile et al. (2014) show that a child's citizenship decreases the parents' subsequent fertility, potentially increasing parents' financial and time resources per child. Parents may adjust how they divide this additional monetary and time budget between their children, depending on whether they see citizenship and their own investments as substitutes or complements (see Almond and Mazumder, 2013; Heckman and Mosso, 2014). If seen as complements, parents might focus on the focal child upon perceiving that the economic returns to investing in this child will be greater, potentially reducing support for older siblings. As parental involvement is strongly related to students' academic achievement (e.g., Fan and Chen, 2001), this could negatively impact siblings' education. If seen as substitutes, parents may prioritize older siblings to compensate for unequal external inputs – potentially having positive implications for siblings' education. Berry et al. (2020) show that parents are averse to inequality between their children and willing to forego earnings to equalize inputs. These dynamics may also change with child age or based on expectations of sibling support (see Becker and Tomes, 1976; Cunha et al., 2010).

Fourth, the younger sibling's access to citizenship may influence older siblings' identity and perceptions of their environment. Awareness of their sibling's citizenship could strengthen their identification with German society and motivate greater educational effort as a path to integration in the long-run. Additional channels not explored in this paper may also affect siblings, such as changes in sibling dynamics, which are often especially close in immigrant families (Nauck and Kohlmann, 1999). Changes in the focal child's endeavors may impact their siblings' academic pursuits. Greater success for the focal child may reduce the older siblings' need to provide academic support, as many immigrant parents expect their children to assist younger siblings (Nauck, 2000).

This paper investigates spillover effects of citizenship from focal children to their older siblings and potential mechanisms by studying the introduction of birthright citizenship in Germany. The reform automatically granted citizenship to immigrant children born since January 1, 2000, if at least one parent had resided in Germany for a minimum of

8 years. The implementation of this reform substantially increased the number of focal children with German citizenship (Statistisches Bundesamt, 2022b). Exploiting the exogenous access to citizenship, I use a difference-in-differences method comparing changes in outcomes between immigrant (treatment) and nonimmigrant (control) families before and after the reform to investigate the effects on focal children's and their older siblings' education. Spillover effects are identified by comparing older siblings born between 1990 and 1998 in households with an eligible focal child – born 2000 or later – to those with an ineligible focal child – born before 2000. I also employ an event study approach to test for differential pre-trends between the treatment and control groups. The analysis is based on data from the German Microcensus – a 1% population sample – and the German National Educational Panel Study (NEPS).

The findings demonstrate that granting birthright citizenship improves both the focal children's and their older siblings' educational outcomes. Citizenship increases the probability of completing secondary education on the academic track by 13 percentage points for focal children and by 6 percentage points for their older siblings – about half the direct effect. Event study graphs strengthen the common trend assumption, thus supporting a causal interpretation of the reform estimates. The reform also increased naturalization among parents and siblings. Thus, some spillovers are direct effects of the sibling's access to citizenship. Additionally, families with a citizen child speak German more often. The results also suggest that spillovers stem from greater parental investment in older siblings, particularly parents attending school events, meeting teachers and helping with presentations, while investments in focal children remain constant.

This paper makes several important contributions to the literature. First, it is the first to investigate the effects of focal children's citizenship on family members other than parents. While prior studies explore how citizenship affects parents – regarding labor market participation, fertility, marriage, out-migration, and integration (Avitabile et al., 2013, 2014; Gathmann and Keller, 2018; Sajons, 2019) – I study its influence on older siblings of children granted birthright citizenship. This contributes to the small but growing body of research on the sibling spillover effects of political reforms. Previous studies have explored spillover effects in areas such as early childhood education, college major choice, grade retention, school performance, and school starting age (see Bettinger

et al., 2014; Dahl et al., 2023; Figlio et al., 2023; Garcia et al., 2024; Goodman et al., 2015; Karbownik and Oezek, 2023; Landerso et al., 2020), with most studies focusing on younger siblings. By contrast, this paper analyzes spillovers from younger to older siblings, showing positive effects of birthright citizenship on older siblings' education and underscoring the importance of considering all potentially affected family members.

Second, the paper adds to research regarding the influence of citizenship on family's integration. Previous studies demonstrate that citizenship acquisition affects labor market participation and success (Bratsberg et al., 2002; Catron, 2019; Gathmann and Keller, 2018; Govind, 2021; Hainmueller et al., 2019), social integration (Hainmueller et al., 2017) and fear of deportation (Hainmueller et al., 2023).[9] Research focusing on children's educational achievement shows positive effects of (birthright) citizenship in the short- and medium-run, focusing on achievements at school (Cygan-Rehm, 2018; Felfe et al., 2020; Gathmann et al., 2021; Sajons and Clots-Figueras, 2014). However, we lack evidence regarding whether students complete school with improved accomplishments, such as attaining the highest academic track. This study addresses this gap by investigating the long-term effects of citizenship up to high school completion.

Finally, the paper enhances our comprehension of the mechanisms underlying citizenship effects. It is the first to investigate how one family member's citizenship access affects naturalization decisions of other family members. It also provides insights into how parents allocate investments across children based on citizenship, drawing on rich data that enable a detailed analysis of parental behavior. Dahl et al. (2022) find that birthright citizenship reduces parental academic support for Muslim immigrant girls but increases it for non-Muslim immigrant boys.

The remainder of this paper is organized as follows: Section 2 provides an overview of the institutional background. Section 3 outlines the empirical strategy and Section 4 provides details on the data sets. Section 5 presents the results, examines possible mechanisms, and tests the robustness of the empirical strategy. Finally, Section 6 concludes the paper.

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[9]For an overview of the previous literature, see Gathmann and Garbers (2023). Further research focuses on implications of immigrants' legal status and deferred deportation under DACA or IRCA in the US (Cortes, 2013; Gihleb et al., 2023; Hsin and Ortega, 2018; Pope, 2016).

2 Institutional Background

2.1 German Nationality Act and the Reform in 1999

German citizenship can be acquired through birth, ethnic German repatriation, adoption, marriage, or naturalization.

On July 15, 1999, the German parliament amended the Nationality Act. Effective on January 1, 2000, this reform brought about several changes. The reform introduced birthright citizenship (*ius soli*), replacing the previous *ius sanguinis* rule, which granted citizenship only by descent. This resulted in the right of immigrant children born in Germany after January 1, 2000, to acquire German citizenship at birth if at least one parent had been legally residing in Germany for at least 8 years at the time of birth and had unlimited right of residence. Eligible children automatically receive citizenship at birth upon registration at the civil registry. There is no requirement to apply separately for citizenship or the option to refuse citizenship during the registration process (BMI, 2023a).[10] Therefore, this citizenship acquisition is automatic and can be exploited as an exogenous variation. By contrast, individuals have to actively apply for standard naturalization which means that naturalization is pursued by a selected group of individuals.

Initially, the law stated that children who obtained German citizenship through the reform had to choose between German and their parents' foreign nationality when they turned 18. However, as of December 20, 2014, children can retain both nationalities as long as they grew up in Germany (BMI, 2023b).[11] Considering that focal children who are studied for the post-reform period were born between 2000 and 2002, none had to choose between two nationalities before the 2014 law reform. Additionally, since August 28, 2007, citizens of EU member states and Switzerland who are naturalized in Germany are permitted to hold multiple nationalities.

Children born between 1990 and 1999 could also benefit from a transition rule allowing

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[10]As citizenship depends on registration at the civil registry office, it is theoretically possible for a child not to be registered and, consequently, not to receive citizenship. Registration is mandatory, and hospitals transmit birth records, making non-registration highly unlikely. An individual living in Germany without registration would face significant restrictions regarding access to social welfare, education, and employment. Furthermore, since children benefiting from the reform are eligible for dual citizenship, the reform does not create any incentives for parents to avoid registering their child.

[11]Growing up in Germany is defined as (i) having lived in Germany for 8 years, (ii) having visited a German school for 6 years, (iii) having obtained a German high school diploma, or (iv) having completed a German vocational training when turning 21 (§ 29 Absatz 1 a StAG).

retroactive citizenship if parents met the same residency requirement and filed the application on their child's behalf between January 1 and December 31, 2000 (§40b StAG). This transition rule might also have affected focal children's older siblings and may have benefited all older siblings studied in this paper – as they were all born between 1990 and 1998 – whose parents were eligible. If an older sibling qualified for the transition rule their parents also had to apply on their behalf for citizenship in 2000. This rule should not confound my analysis as siblings' eligibility for the transition rule did not depend on whether the focal child was born before or after the reform or on whether the focal child obtained citizenship through the reform. Use of this rule was limited: only around 20% of eligible children were naturalized (Felfe et al., 2020; Worbs, 2008). In a robustness check in Table D.7 I also show that my results do not change if I exclude focal children or older siblings that made use of the transition rule.

The second part of the reform shortened the residency requirement for naturalization from 15 to 8 years (BMI, 2023b). Unlike in the case of birthright citizenship, for naturalization, adults must renounce their previous citizenship when naturalized[12] and meet certain requirements[13]. This reform component is not studied in this paper. The reduction in the residency requirement is not connected to the focal child's birth date and applies equally to focal children in the treatment group born before and after the cutoff. It should therefore not affect the estimation strategy in this paper.

Immigrant children who do not receive German citizenship at birth obtain the status of either temporary or permanent residents. Individuals with citizenship and those considered permanent residents enjoy some of the same privileges: They have an unlimited right to stay in Germany and are eligible for social assistance, unemployment benefits, daycare, child benefits, parental benefits, and alimony advances (Riphahn et al., 2013).

Citizenship offers key advantages over permanent residency, especially during adolescence – the age studied in this paper. It provides access to all professions, including life tenure as a civil servant in institutions like the police or judiciary, as well as the ability to work as a doctor or start a business without immigration restrictions (Integrationsbeauftragte, 2023, §9 AufenthG). Citizenship also allows individuals to work, study, and travel

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[12]The new German reform which became effective on June 27, 2024 introduced the possibility of dual citizenship: From 2024 onward, individuals do not have to renounce their previous citizenship.

[13]Requirements include legal residency, language proficiency, financial self-sufficiency, no criminal convictions, and alignment with democratic values (§10 StAG).

visa-free in all European Union countries, broadening labor market and employment opportunities.[14] Furthermore, individuals are eligible to vote in national and EU elections and run for political office. They also benefit from travel and visa facilitation outside the EU, protection against deportation, and assistance from German embassies abroad. Finally, individuals enjoy an unlimited right of residency in Germany, while permanent residency expires after a six-month stay outside the country. These advantages apply only to focal children, while siblings benefit only if they naturalize themselves. Thus, these advantages might explain spillovers on siblings if the sibling naturalizes.

Figure 1 shows the number of births per year in Germany by the focal child's and parents' citizenship. A large share of children born in Germany receive German citizenship at the time of birth, typically because one parent is a German citizen. Between 1990 and 1999, most immigrant children were born without German citizenship (around 10% of all focal children). The introduction of birthright citizenship can also be observed in the figure: since 2000, approximately 5% of children have received German citizenship at birth despite neither parent being a citizen – roughly half the share of the previous non-citizens. Despite the reform, some individuals still do not possess German citizenship at birth due to the eight-year residency requirement imposed on their parents. With new families immigrating to Germany each year, the proportion of families who do not meet the eight-year residency requirement remains stable. From 2015 onward, as refugee arrivals increased, so did the share of children born without German citizenship.

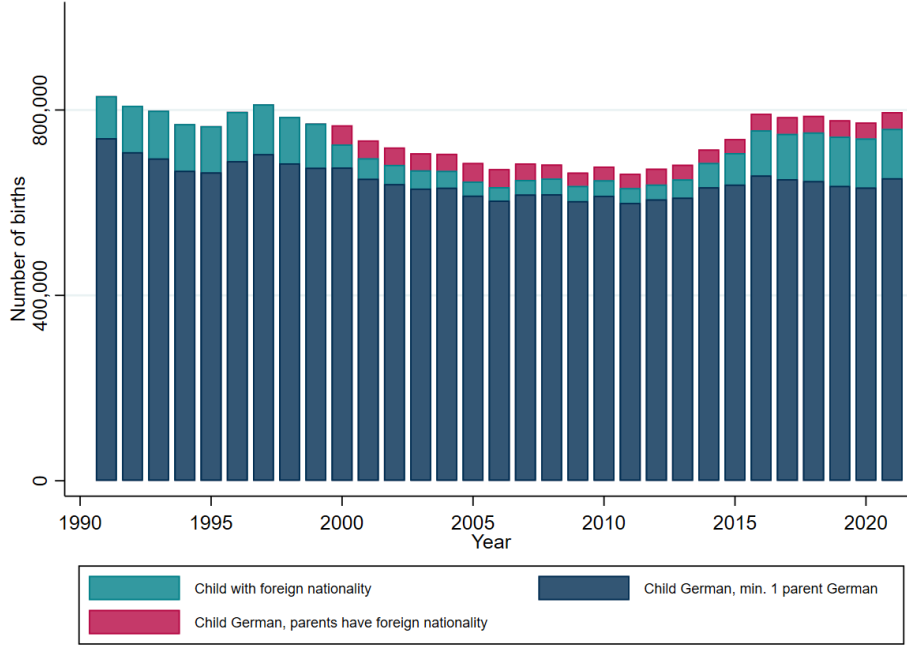## 2.2   The German Secondary School System

In Germany, children attend primary school for 4 years[15] before moving on to different school tracks based on their abilities and academic potential. At the end of primary school (around age 10), students receive recommendations from their teachers regarding the secondary school track they should pursue. There are three main tracks in German secondary schooling: the lowest track (Hauptschule), the intermediary track (Realschule), and the academic track (Gymnasium). The academic track prepares students for higher education. Most schools of all three types are public and tuition-free (Goerlitz et al.,

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[14]This is an additional advantage for focal children whose parents did not emigrate from another EU country.

[15]In the federal states Berlin and Brandenburg, children visit primary school for 6 years, but the total years of schooling to acquire certain school leaving certificates are the same.

Figure 1: Number of births by focal child's and parents' citizenship status

2018).

Children in grades 12 or 13 can obtain a university entrance qualification ((Fach-) Hochschulreife) if they pass a final examination.[16] This qualification can be obtained at a Gymnasium, comprehensive schools[17] and certain vocational schools, certifying the child to attend a higher education institution (university or university of applied sciences). Completing higher education grants individuals access to certain professions that require a university degree.

Investigating the type of school degree is important because different degrees can result in considerably different employment opportunities, and tertiary education eligibility increases chances of securing higher-paying occupations (Nordin et al., 2020). There exists an immigrant-nonimmigrant gap in school degrees: 57% of nonimmigrant and 50% of immigrant individuals aged 18 to 25 finished secondary school with the university entrance

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[16]Whether the child obtains a higher education entrance qualification after 12 or 13 years depends on the school the child attends. Children visit a Gymnasium for 12 years and comprehensive schools for 13 years. The duration of the Gymnasium was reduced from 13 to 12 years in the 2000s. Some federal states have extended the duration to 13 years in recent years.

[17]Comprehensive schools include the low, middle, and academic tracks, prepare for all three degrees, and are at least until grade 10.

qualification (Statistisches Bundesamt, 2022a).

3   Identification Strategy

To identify the causal effect of birthright citizenship on the education of focal children and their older siblings, I exploit the exogenous and automatic access to citizenship for focal children born after January 1, 2000. Unlike naturalization, which is pursued by a selective portion of the population, the German reform contains two provisions that make the eligibility for birthright citizenship exogenous: citizenship is granted automatically; and is not influenced by parental decisions.[18] I employ event study and difference-in-differences approaches and individual level data on secondary school degrees and school tracks for both individuals directly affected by the reform (focal children) and their older siblings.

3.1   Event Study Analysis

I use an event study design to estimate the effects on the focal child's and sibling's education in which I interact the treatment group indicator with the focal child's birth year:

$$Y_{it} = \gamma_0 + \gamma_1 Treat_i + \sum_{b \neq 1999} \gamma_2 b_i + \sum_{b \neq 1999} \gamma_3 Treat_i \times b_i + X'_{it}\gamma_4 + \mu_m + \delta_t + \zeta_s + \eta_{st} + \epsilon_{itb}. \quad (1)$$

In this equation, Y_{it} represents the completion of the academic school track for focal child or sibling i in year t. It is an indicator which equals 1 if the individual has obtained a university entrance qualification or is currently attending a school that leads to such qualification at ages 17-22 and 0 otherwise. $Treat_i$ is the treatment indicator, that is set to 1 if both parents were born outside Germany (immigrant households) and 0 if at least one parent was born in Germany (nonimmigrant households). I include focal child's birth year indicators b and exclude 1999 – the year before the implementation of the reform – as the reference year. The parameter of interest, γ_3, is the interaction of the treatment

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[18]The reform of the German nationality law from January 1, 2000, entails that all immigrant children born in 2000 or after to non-Germans will be granted German citizenship if at least one parent has been legally residing in the country for at least 8 years at the time of the child's birth and if the child is registered at the civil registry office (see Section 2 for a discussion on this).

indicator $Treat_i$ with the focal child's birth year indicators b from 1992 to 2002, and represents the effect of the different birth cohorts relative to the 1999 cohort.[19] Using an event study approach allows me to assess diverging pre-trends of the treatment and control groups.

Following Buckles and Hungerman (2013), who found differences in outcomes for children born in different months of the year, I include a set of the focal child's birth month indicators μ_m, to account for any seasonal effects. I also include survey year (δ_t), federal state (ζ_s) and survey year times state (η_{st}) fixed effects to control for remaining differences in the states' school systems like the length of elementary school and different types of schools in the lower school tracks as well as differential time trends. The vector of control variables X_{it} includes the child's age and gender, the mother's age at the child's birth, and the parents' highest educational level. For the sibling spillover analysis, it additionally includes the birth order of the siblings, the age difference between the focal child and the older sibling and the older sibling's birth month fixed effects.

The employed identification strategy involves comparing families in which the focal child was born around the cutoff date of January 1, 2000. This approach relies on the assumption that these families are otherwise very similar. Table A.1 contrasts older siblings whose younger sibling was born pre-reform (1994–1999) with those born post-reform (2000–2002). By design, the birth years of focal children in the two groups differ. Due to the sibling sample being restricted to birth years 1990–1998, the average age gap is larger in the post-reform group (5 vs. 3 years), since younger siblings born after 2000 can only have older siblings born before 1999. Despite these differences, the groups are similar across key characteristics, such as gender, maternal age, and parental education. The main distinction is a higher share of immigrant families in the post-reform group, consistent with broader demographic trends and increasing immigration in Germany.

3.2 Difference-in-differences Approach

In the second step, I estimate a difference-in-differences approach based on the event study methods described in Equation 1 to estimate the effects on the focal child's and the

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[19]For the analysis of sibling spillovers, the birth cohorts of focal children are limited to the years 1994 to 2002 to ensure that the majority of each focal child's older siblings are included in the sample. See Section 4 for a discussion of this.

sibling's academic school track completion. I also use difference-in-differences methods to analyze the mechanisms in Section 5.3, as it is the preferred specification and the NEPS is a cohort study and does not support comparisons across birth cohorts.

The approach takes the following form:

$$Y_{it} = \beta_0 + \beta_1 Treat_i + \beta_2 Post_b + \beta_3 Treat_i \times Post_b + X'_{it}\beta_4 + \sum_{b \neq 1999} \beta_5 b_i + \mu_m + \delta_t + \zeta_s + \epsilon_{it}. \quad (2)$$

The definition of the outcome variable Y_{it}, the treatment indicator $Treat_i$, the birth year b_i, the fixed effects and control variables corresponds to those in Equation 1. $Post_b$ equals 1 if the focal child i was born after January 1, 2000, and 0 for focal children born before December 31, 1999.

The parameter of interest is β_3, which identifies changes in outcomes for focal children and siblings in the treatment group (children born to two born-abroad parents) compared to the control group (children born to at least one parent born in Germany) between the pre- and post-reform periods, assuming a common trend. This estimator corresponds to an intention-to-treat (ITT) estimator for three reasons: First, the pretreatment sample includes sibling pairs with a focal child qualifying for citizenship based on their parents' citizenship (if the parents naturalized before birth) or the transition rule. Second, the post-treatment sample includes sibling pairs with focal children who did not receive birthright citizenship due to their parents not meeting the 8-year residency requirement or lacking legal residency status. Third, the control group may include sibling pairs with focal children without German citizenship because their parents were born in Germany but whose grandparents immigrated.[20] However, as the proportion of focal children in the control group with citizenship at birth appears to be 100 across birth cohorts (see Figure 1), the proportion of children of German-born parents without German citizenship seems negligible. All these factors indicate that the estimate represents a conservative estimate of the impact of birthright citizenship on focal children and older siblings. As a result, I later scale the estimated main effects by the take-up rate of birthright citizenship in the treatment group, as estimated in the first stage regression (Table B.2) to obtain an

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[20]Using parents migration history and not citizenship status for the definition of the treatment group is an approximation because I only observe the parents' citizenship status and length of residency for parents living in the same household. Additionally, a definition based on parents' citizenship status would be endogenous, as parents' naturalization is an endogenous choice.

average treatment effect on the treated (ATT).

4 Data

4.1 German Microcensus

The main analysis uses German Microcensus data from 2010 to 2021. The Microcensus is a representative survey of 1% of households (Statistisches Bundesamt, GESIS, 2022). It includes individuals in private households or communal accommodations, using a rotating sample design where each household is surveyed for four consecutive years. This setup primarily allows for cross-sectional analyses. The advantage of using the Microcensus is its large sample size and mandatory participation, which decreases sample selection biases. One household member responds for all members, and data are only collected for individuals living in the same household. Thus, older siblings are included only if they reside with their parents. Section 5.5 addresses possible sample selection bias due to this restriction.

The main outcome measures educational attainment of focal children and their older siblings as a binary indicator equal to 1 if the individual has or is currently pursuing a university entrance qualification ((Fach-)Hochschulreife). This includes individuals enrolled in the academic secondary track that grants university access, capturing those who may not have completed school by 2021 (for a similar approach, see Piopiunik, 2014). This measure is also unaffected by variations in school duration across German states and is assessed for individuals aged 17–22, the typical age of completion. Each wave of the Microcensus measures this outcome variable.

The treatment group consists of focal children and their siblings with two foreign-born parents. The reform only applied to children born to two non-German citizens. Throughout the study period, 15% of children in the sample have two foreign-born parents (regardless of their parents' citizenship status). The control group comprises all focal children and their siblings with at least one German-born parent.

The sample of older siblings is defined as those born between 1990 and 1998, ensuring they were born before the reform. Each must have a sibling (the focal child) born between 1994 and 2002, with at least a one-year age gap. The focal child cohort range ensures that

the majority of each focal child's older siblings are included in the sample, given a median four-year age difference between siblings in the Microcensus.[21] Only older siblings born in Germany are included to ensure uniform eligibility under the transition rule. Adoptive and step-siblings are included if co-residing with the focal child.

Older siblings may appear multiple times in the data – once for each focal child they are matched to – based on when their sibling was born. A focal child can also be included multiple times depending on the number of older siblings.[22]

All older siblings in my sample are themselves not directly affected by the reform but could have received citizenship retroactively in 2000 under the transition rule, provided their parents legally resided in Germany for at least 8 years at the time of birth and applied for German citizenship retroactively on the sibling's behalf between January 1 and December 31, 2000 (§40b StAG). Between 2000 and 2007, 49,169 children obtained citizenship through this rule, about 20% of those eligible (Felfe et al., 2020; Worbs, 2008). These siblings would have obtained citizenship later in childhood (at age 2 or later), unlike focal children who acquired it at birth.

The samples of focal children and older siblings include all individuals aged 17 to 22, regardless of current status (in school, working, studying, or neither). Missing values for control variables are imputed with means for continuous variables and defined as a separate category for categorical ones. First-generation immigrant children and ethnic German repatriates[23] are excluded, as they were unaffected by the reform and have different citizenship pathways (see Piopiunik and Ruhose, 2017).

In the mechanisms section, I explore how birthright citizenship might have spillovers on siblings through two channels using the Microcensus. First, I investigate naturalization behavior by analyzing citizenship status of parents and siblings. Additionally, I assess whether siblings received citizenship via the transition rule (see Section 2 for a more detailed description), using a binary variable equal to 1 for individuals born before 2000

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[21]This means the sample includes at least 50% of older siblings for each focal child. For example, older siblings born in 1990-1993 are included for the focal child cohort of 1994, while those born in 1990-1998 are included for the focal child cohort of 2002.

[22]Due to this sample setup, it is important to cluster standard errors at the family level. I show this test in Table D.7 and show that the results still hold. However, the effects on older siblings of the focal child child birth cohort 2002 is no longer statistically significant.

[23]Ethnic German repatriates refer to individuals who migrated to Germany and are descendants of Germans from the former Soviet Union and other Eastern European countries.

who acquired citizenship in 2000 or 2001 – because 89% of children who benefited from the reform were naturalized in these years (see Worbs, 2008). Second, I examine family language use using an indicator for whether German is predominantly spoken at home.

Table 1 compares predetermined characteristics of the treatment and control groups for older siblings born between 1990 and 1998 who are matched to a focal child born between 1994 and 2002. Key variables, such as the focal child's gender and birth month are similar across groups. However, there as some small statistically significant differences in terms of the focal child's birth year and the older sibling's age. Notable differences also exist in terms of parental characteristics, highlighting the importance of evaluating pre-trends. Immigrant mothers are on average younger at the time of childbirth than nonimmigrant mothers (25 vs. 28 years), and control group parents have higher levels of education compared with those in the treatment group (30% with a university degree vs. 8%). Parents' regions[24] of origin also differ. While most control group parents are German-born,[25] 46-50% of treatment group parents were born in Turkey, followed by families from the Balkans and EU-12 countries. These distributions reflect broader demographic patterns in Germany. (see e.g., Schuehrer, 2018).

4.2 National Educational Panel Study

To further disentangle the channels through which birthright citizenship spillovers on older siblings, I use data from the National Educational Panel Study (NEPS; see Blossfeld and Roßbach, 2019), a multi-cohort panel study tracking educational trajectories of six cohorts in Germany. The focus is on cohorts 3 and 4, which align with the birth cohorts of focal children and their older siblings studied in the Microcensus. I use cohort 3 – surveying fifth-graders (ages 10-11) in 2010 – to analyze focal children, and cohort 4 – surveying ninth-graders (ages 14-15) in 2010 – to study older siblings (Skopek et al., 2012). The surveys are annual, and participants are followed through school. Participants leaving the sampled school or class due to grade retention or graduation are tracked individually. However, children who had repeated or skipped a grade before the survey began are not

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[24]The region of origin is approximated using the current or previous citizenship, as the country of origin is only surveyed in a few waves in the Microcensus.

[25]Some control group parents are misreported as foreign-born due to survey errors, so I use the cleaned and validated migration status from the Microcensus in my analysis.

Table 1: Comparison of the Treatment and Control Groups

	Control Group	Treatment Group	Difference
	Mean/Percentage		
Focal Child is male	51.93 %	52.04 %	0.11
Birth month (focal child)	6.45 (3.38)	6.44 (3.42)	-0.01
Birth year (focal child)	1998.06 (2.32)	1998.43 (2.32)	0.37***
Older sibling's age (in years)	19.16 (1.59)	19.28 (1.60)	0.11***
Age difference between siblings (in years)	3.83 (2.01)	4.24 (2.24)	0.41***
Mother's age at birth (in years)	28.10 (4.02)	24.68 (4.61)	-3.35***
Highest post-secondary degree in the household			
No degree	5.21 %	48.16 %	42.95***
Vocational training	60.87 %	39.64 %	-21.23***
University	29.61 %	8.04 %	-21.57***
Missing	4.3 %	4.2 %	-0.0014
Mother's region of origin			
German	88.83 %	0.23 %	-88.59***
Turkey	0.48 %	49.82 %	49.34***
Eastern Europe	0.94 %	4.18 %	3.24***
Balkan	0.43 %	12.31 %	11.88***
Eu 12	0.99 %	8.23 %	7.24***
Other	1.69 %	20.57 %	18.88***
Missing	6.64 %	4.66 %	-1.99***
Father's region of origin			
German	75.12%	0.29 %	-74.83***
Turkey	0.48 %	45.90 %	45.41***
Eastern Europe	0.33 %	3.53 %	3.21***
Balkan	0.46 %	11.43 %	10.96***
Eu 12	1.28 %	7.78 %	6.5***
Other	1.12 %	19.03 %	17.91***
Missing	21.20 %	12.05 %	-9.16***
Observations	76,237	13,778	

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard deviation in parentheses. The statistics are based on the sample of older siblings born 1990-1998 matched to a focal child born 1994-2002. *Source:* German Microcensus (2010-2021).

included.[26] I use data from child and parent surveys.

The analysis includes focal children born between 1999 and 2000[27] and older siblings born in 1994-1997[28] with a younger sibling (focal child) born 1998-2001. Since NEPS samples cohorts individually, parents are not surveyed about both children, making within-family investigations of the division of parental investments impossible. As in the Microcensus, treatment group children have two foreign-born parents, while control group children have at least one German-born parent. The focal child sample includes 21,669 control and 3,136 treatment cases (13% treatment), while the sibling sample includes 3,028 control and 170 treatment cases (5% treatment).

To measure parental involvement, I construct an overall index along with four subindices that reflect different investment domains. Using indices ensures that the results are not skewed by a single survey question that captures only one aspect of parental investment. The first counts the number of educational resources at home: a desk, educational software, books for homework, and a computer.[29] A second subindex measures the frequency of school-related conversations – such as discussing class topics and addressing problems in school – between the child and their parents.[30] With a third subindex, I investigate the frequency of parental support, which includes purchasing learning materials, searching for information for class, and assisting with presentation preparation.[31] And the final subindex captures the frequency of contact between parents and the school, including attending parent-teacher conferences, participating in school events, engaging in the Parent-Teacher Association, or contacting teachers.[32] Higher values across all variables indicate greater parental involvement in education.

As an additional channel, I investigate the older sibling's identity and expected discrimination. Identity is measured through agreement with six statements about connection to

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[26]Felfe et al. (2020) show that birthright citizenship reduces grade retention by 24.5%, potentially causing slight sample selection among focal children.

[27]93% of the cohort 3 sample was born in 1999 and 2000: 40.2% in 1999, and 52.5% in 2000.

[28]0.3% born in other years are excluded from the analysis.

[29]Focal children are surveyed across waves 1-5, while older siblings are surveyed in wave 1.

[30]This index is derived from child surveys conducted in waves 7-8 for focal children and waves 4-9 for older siblings.

[31]Parents are surveyed on this in waves 5-7 for focal children and waves 1-6 for older siblings. Due to data availability, the variable for older siblings only includes the frequency of purchasing materials and the frequency of helping with presentations.

[32]This variable is measured from the parent's perspective in wave 5 for focal children and wave 3 for older siblings.

Germany and German society. Responses are coded as binary indicators (1 = identifies with Germany).[33] To understand the siblings' expected discrimination, I use responses to whether individuals expect to be disadvantaged in finding an apprenticeship due to a foreign name, foreign appearance, wearing a headscarf, or limited German skills. Responses indicating rather yes or yes are defined as expecting discrimination (=1).[34] This outcome is relevant as it reflects the siblings' anticipated discrimination in the labor market and may shape educational and career choices.

5   Results

5.1   Effects on Birthright Citizenship

The first step in the analysis is to determine whether the reform increased citizenship at birth for focal children born after the birth date cutoff. Figure 2 displays the percentage of children with German citizenship in a given birth quarter, separately for treatment and control groups.

As expected, all children in nonimmigrant households received German citizenship at birth regardless of birth date. By contrast, in immigrant households, the share increased substantially after the reform – from 30-50% before 2000 to about 75% afterwards. Before the reform, they acquired citizenship because one of their parents naturalized before childbirth or because their parents applied for citizenship under the transition rule on their behalf. The share does not reach 100% because eligibility also requires that at least one parent had legally resided in Germany for 8 years at the time of birth.[35] In general, there is a slight upward trend before and after the reform, with children born in later quarters more likely to have German citizenship at birth.

Table B.2 presents the first-stage regression results for the treatment group. This is shown for the focal children and the sample of siblings matched to focal children – both over a

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[33]These questions were surveyed in wave 7.

[34]All students were surveyed this question in wave 2 independent of their intentions to search for an apprenticeship.

[35]Limiting the sample to children with one parent resident for at least eight years raises the post-reform citizenship rate to over 80%. However, it does not reach 100% due to measurement errors, the availability of data only for cohabiting parents, and the lack of legal status information in the Microcensus. This is particularly relevant as legal residency with an unlimited right of residence for eight years is a requirement.

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Figure 2: Percentage of Children with Citizenship at Birth by Birth Quarter
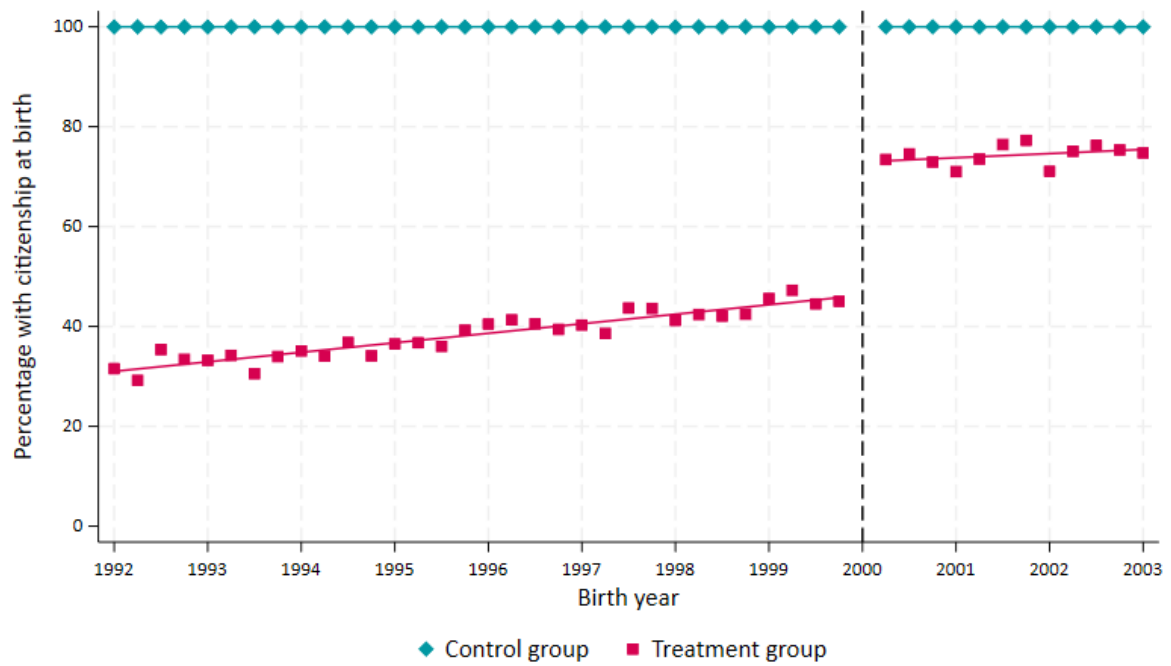
Note: The graph shows the share of focal children with German citizenship at birth for the treatment and control group by birth quarter. The treatment group consists of children whose parents were both born outside of Germany, whereas the control group comprises children with at least one parent born in Germany. *Source:* German Microcensus (2010-2021).

longer time frame (birth cohorts 1992-2002 and 1994-2002) and a short window around the birth date cutoff (1999-2000). These samples are the same as those used in the main analysis in Section 5.2. The sample size in column 3 corresponds to the treatment group size in Table 1, but is slightly smaller due to missing citizenship data. The smaller sample size applies to all columns.[36]

I observe a 36 percentage point increase in the share of focal children in the treatment group obtaining German citizenship at birth for those born between 1992 and 2002, and a 25 percentage point increase for those born between 1999 and 2000. In the matched sample of older siblings, the increase is 37 percentage points for focal children born 1994-2002, and 33 percentage points for those born 1999-2000. The increase is more pronounced with a larger bandwidth due to the overall upward trend in citizenship at birth. Differences in effect sizes are more pronounced across the two focal child samples than between the sibling samples. This is due to the sibling sample restriction to those born in Germany, which ensures that the treatment group consists only of families who migrated before the older sibling's birth. As a result, these families are more likely to have met the eight-year residence requirement by the time of the reform and when the younger sibling (the focal child) was born. In the main analysis, I estimate an ITT effect and scale the effects estimated in the different specifications using the complier rate for each sample (see Section 3).

Figure 3 breaks down the treatment group by maternal region of origin. The largest increase in citizenship is seen among children of Turkish-origin mothers – almost 50 percentage points, followed by children of mothers from the Balkans and EU12 countries, while no substantial change occurred for those from Eastern Europe or other countries. These differences reflect varying migration histories: eligibility requires parental residence in Germany for at least eight years prior to childbirth, which was more common among Turkish and Balkan migrants. A slight decline among Eastern European families after 2000 is likely due to post-2000 migration increases from these countries, particularly ahead of the EU's 2004 enlargement (Statistisches Bundesamt, 2025).

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[36]In Table D.8, I estimate my main analysis using the sample of children with known citizenship status. The sample size is slightly smaller, as expected, but the results are robust.

Figure 3: Percentage of Children with Citizenship at Birth by Birth Year – By Mother's Region of Origin
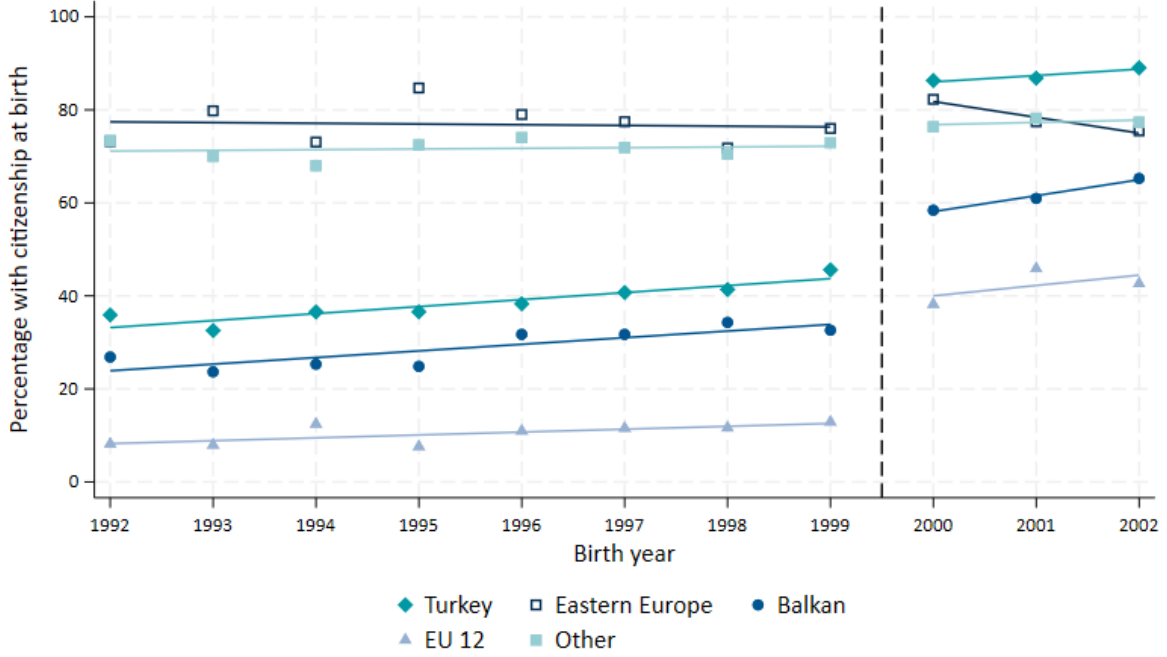
Note: The graph shows the share of focal children with German citizenship at birth for different groups within the treatment group by birth year. *Source:* German Microcensus (2010-2021).
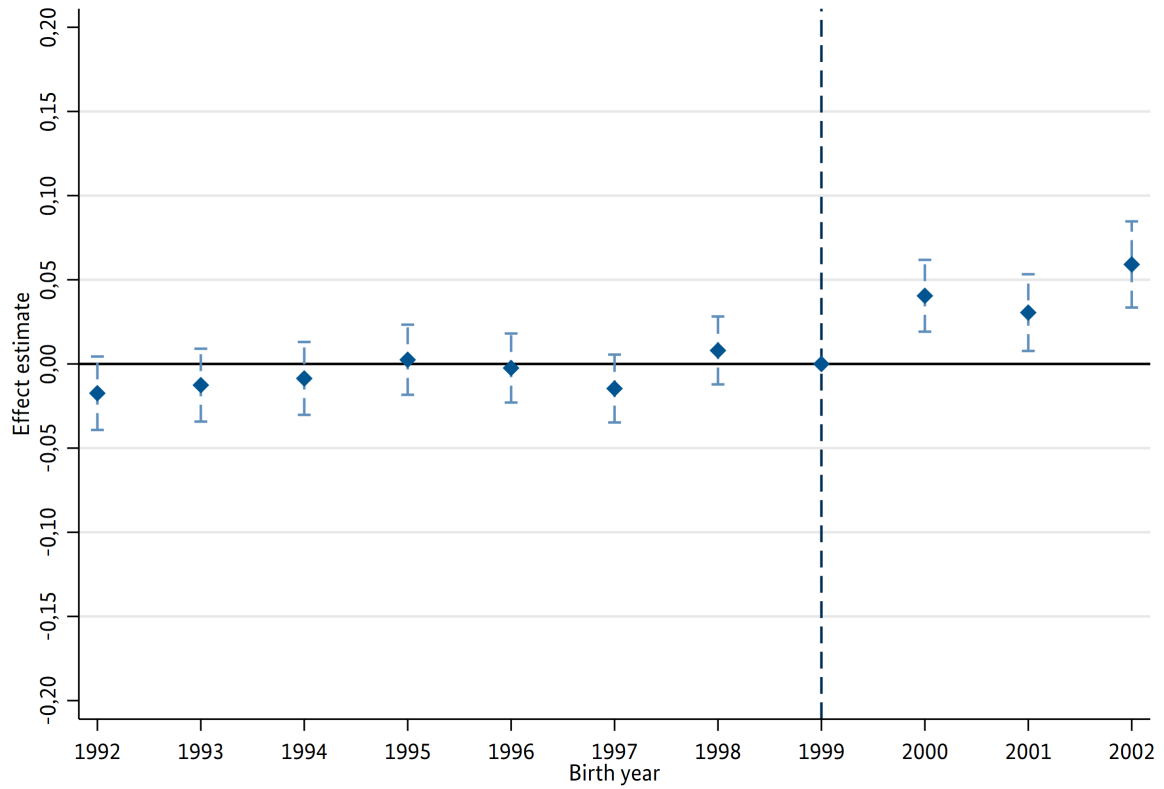
5.2 Effects on Focal Children's and Siblings' Education

After establishing that the reform increased German citizenship for immigrant children, this section assesses its effects on focal children and their older siblings.

As shown in Figure 4, I examine the impact of the reform on focal children's completion of the academic school track using the event study approach. Completion is measured as a binary indicator, equal to 1 if the individual holds a university entrance certificate or is enrolled in a secondary school track that leads to such a certificate. The graph plots the interaction between the treatment variable and the birth cohorts relative to 1999 – the birth year before the reform. For pre-reform cohorts (1992-1998) the estimates show no statistically significant differences in pre-trends, supporting the assumption of parallel trends and thus the causal interpretation. The interaction coefficients of the birth cohorts from 2000 to 2002 show a statistically significant increase in focal children's academic school track completion of 3 to 6 percentage points, which remains consistent for the first three birth cohorts.[37]

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[37]I cannot investigate any later birth cohorts because 2021 is the most recent available data, and

Figure 4: Effect on Focal Children's Academic School Track Completion

These results confirm benefits for focal children. I next assess whether the reform had spillover effects on the academic school track completion of older siblings. Figure 5 presents the effects of the birthright citizenship reform for older siblings born between 1990 and 1998. It again plots the interaction of the treatment variable $Treat_i$ with the focal child's birth year in comparison with the pre-reform year (1999). Pre-trends appear to be parallel, although the 1996 cohort shows a large but insignificant coefficient. The results also reveal a statistically significant increase in the likelihood of older siblings completing the academic school track if the focal child is born after the reform cutoff by 3 to 4 percentage points.

Figure 5: Effect on Siblings' Academic School Track Completion
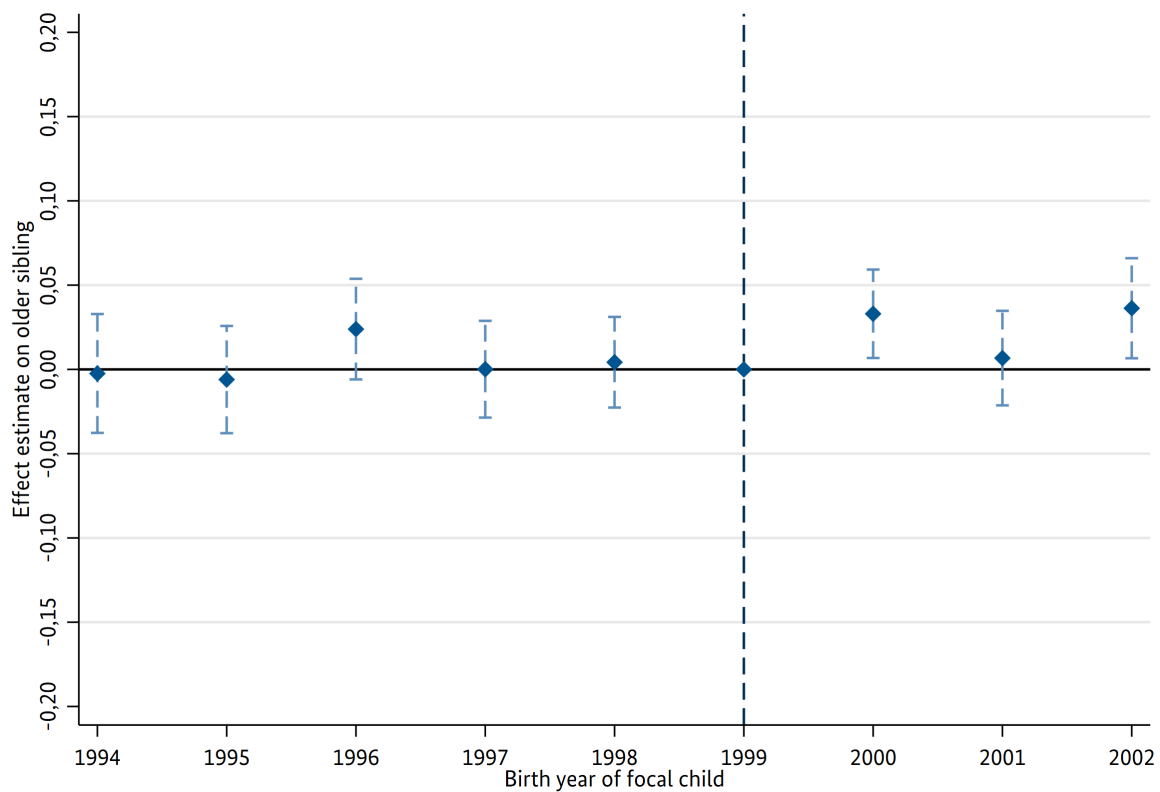
Note: These coefficients are estimated using the event study approach described in Equation 1. The figure displays the coefficients of the interaction of the treatment variable $Treat_i$ with the focal child's birth cohorts compared to the last pre-reform year 1999. The outcome variable captures whether the sibling (aged 17-22) either obtained a university entrance qualification or currently attends a school track leading to university entrance qualification. The treatment group includes all children born to two parents who were born abroad and immigrated. The control group includes all children with at least one parent born in Germany. The regression includes year and state fixed effects, year*state fixed effects, the focal child's gender, the mother's age at birth, the families highest educational degree, the focal child's birth month, the birth order, the age difference between siblings, and the sibling's birth month. N=90,015. 90% confidence based on robust standard errors intervals shown. *Source:* German Microcensus (2010-2021).

In Table 2, I confirm the results using a difference-in-differences approach. Consistent with the analyses presented in Figures 4 and 5, the outcome variable is a binary indicator

younger cohorts would not yet be old enough.

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equal to 1 if the individual possesses a university entrance certificate or is enrolled in a secondary school track that leads to one. Columns 1 to 4 show that the birthright citizenship reform significantly increases the probability of the focal child completing school at the academic track. This effect persists when I limit the sample to children born in the 2 years around the cutoff year (1999-2000, columns 3-4). This narrower sample includes children on both sides of the cutoff who are likely more comparable than when comparing children born several years before and after the reform, and therefore less prone to cohort-related differences.[38] It also persists when excluding socio-demographic and socio-economic controls and fixed effects (columns 1 and 3).

Citizenship increases a focal child's likelihood of obtaining a university entrance qualification or attending a school track which provides this qualification by 4.7 percentage points (or 3.9 percentage points when restricting the birth cohorts). This represents a 6-7% increase over the pre-reform average. Scaling the effect by the first-stage complier rate (36 and 25 percentage points), yields a local average treatment effect of 13 (cohorts 1992-2002) or 16 (cohorts 1999-2000) percentage points – or 19-23% compared with the pre-reform mean.

The results in columns 5-6 show that granting citizenship to the focal child increases the probability of older siblings completing secondary school at the academic track. Restricting the sample to older siblings of focal children born in 1999 or 2000 (columns 7-8) produces an even larger treatment effect.[39] The effect sizes are very similar irrespective of whether I control for socio-demographics and fixed effects or not.

The spillover effect on older siblings is smaller than the direct effect on the focal child, at 2.1 to 3.3 percentage points (or 3-6% over the pre-reform average). Scaling the spillover effect by the complier rate (37 or 33 percentage points) to calculate the local average treatment effect yields an effect size of 6 (focal child cohorts 1994-2002) or 10 (focal child cohorts 1999-2000) percentage points. The spillover effect corresponds to 46 (focal birth

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[38]I do not restrict the sample further to only several months before and after the reform cutoff, as Buckles and Hungerman (2013) demonstrate that children born in the first few months of the year are for example more likely to be born to teenage mothers and mothers with lower educational attainment. Consequently, children born before and after January 1 are not comparable.

[39]The larger effect size is likely attributable to the sibling sample composition, as the average age difference between siblings is greater in this restricted sample (4.1 vs. 3.5 years) due to the restriction of the sample to the 1999 and 2000 birth cohorts of the younger siblings. As demonstrated in Table C.4, the effects are more pronounced for siblings with a larger age difference.

cohorts 1994-2002) to 63% (focal birth cohorts 1999-2000) of the size of the direct effect on the focal child.

Table 2: Effects on Focal Child's and Older Sibling's High School Completion - Difference-in-differences

	Focal Child				Older Sibling			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treat × Post	0.039***	0.047***	0.033**	0.039***	0.022**	0.021**	0.038**	0.033**
	(0.007)	(0.007)	(0.013)	(0.013)	(0.010)	(0.009)	(0.017)	(0.016)
Observations	307,494		57,100		90,015		25,669	
Pre-reform Mean	0.656		0.681		0.611		0.617	
Birth cohorts (focal c.)	1992-2002		1999-2000		1994-2002		1999-2000	
Controls and FE		✓		✓		✓		✓

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses. The treatment group includes all children born to two parents who were born abroad and immigrated. The control group includes all children with at least one parent born in Germany. Columns 2, 4, 6 and 8 include year and state fixed effects, year*times*state fixed effects, the focal child's gender, the mother's age at birth, the families highest educational degree and the focal child's birth month, columns 6 and 8 also control for the birth order, the age difference between siblings, and the sibling's birth month. The pre-reform mean shows the sample average for the treatment group born before the reform. *Source:* German Microcensus (2010-2021).

5.3   Mechanisms

This section investigates whether increased naturalization of parents and siblings, greater use of German in the household, changes in parental investments, or shifts in the sibling's identity and perception of discrimination can explain the substantial effects on older siblings. The positive spillover effects on the older siblings' education could be a direct effect of the focal child's education on them. Karbownik and Oezek (2023) show that being among the oldest children in class improves academic performance, and benefits younger siblings, while effects on older siblings are less clear. Therefore, there are likely other channels through which citizenship impacts older siblings' education.

Naturalization. I first examine whether other family members naturalize more often. Access to birthright citizenship may reduce information barriers regarding citizenship for parents and siblings. Consequently, parents may naturalize, enabling their children to gain citizenship. Alternatively, parents may apply for citizenship on behalf of the older siblings via the transition rule or older siblings might naturalize independently at age 18. The results in Table 3 (columns 1-3) show that the focal child's citizenship increases the likelihood that other family members are also citizens – 3.8 percentage points for older siblings[40], 2.5 percentage points for mothers, and 1.8 percentage points for fathers.

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[40]The sample size for this analysis differs from that presented in Table 2 due to missing citizenship

The larger increase for siblings compared to the parents indicates that some siblings naturalized independently or via the transition rule. However, the results in column 4 shows that the increase is not driven by the transition rule.[41] This finding aligns with research by Felfe et al. (2020), who find low take-up of the transition rule. Many siblings therefore likely chose to naturalize after turning 18.

German Proficiency. A child's citizenship might motivate parents to integrate into society and learn German, influencing German use at home. Table 3, column 5, demonstrates a 3.6 percentage points increase in German as the main household language.[42] This supports findings by Avitabile et al. (2013) that a child's birthright citizenship increases parents' frequency of reading German newspapers in early years – an effect that seems to translate into German usage in general and to persist. This finding is also plausible given that the parents of the affected children had already lived in Germany for at least eight years at the time of the child's birth, and for over twenty years by the time the German usage was measured in the Microcensus.

Table 3: Effects on Naturalization of Family Members and German Language Usage

| | | Citizenship | | Transition Rule | German in |
| | Mother | Father | Sibling | Sibling | the Household |
	(1)	(2)	(3)	(4)	(5)
Treat × Post	0.025***	0.018***	0.038***	0.001	0.036***
	(0.006)	(0.007)	(0.013)	(0.005)	(0.012)
Observations	604,774	491,640	62,596	62,596	51,566
Pre-reform Mean	0.319	0.370	0.575	0.035	0.456

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses. The treatment group includes all children born to two parents who were born abroad and immigrated. The control group includes all children with at least one parent born in Germany. All regressions include year and state fixed effects, year*times*state fixed effects, the focal child's gender, the mother's age at birth, the families highest educational degree and the focal child's birth month, columns 3-5 also include the birth order, the age difference between siblings, and the sibling's birth month as controls. The outcome variable "Citizenship" captures whether the mother (col. 1), the father (col. 2) or the older sibling (col. 3) has German citizenship at the time of the survey and "Transition rule" indicates whether individuals made use of the transition rule described in Section 2. This is a binary variable which equals 1 for individuals who are born before 2000 and who received their German citizenship in 2000 or 2001 (as 89% of children who benefited from the rule naturalized in 2000 or 2001, see Worbs, 2008). "German in the Household" captures whether the household speaks predominantly German. *Source:* German Microcensus (2010-2021).

Parental Investments. Parents' behavior may also be impacted by citizenship access,

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data for a portion of the Microcensus sample.

[41] For this analysis, I use a proxy defining all individuals born between 1990 and 1999 who received German citizenship through naturalization in 2000 or 2001 as beneficiaries of the transition rule.

[42] The sample size of this analysis is smaller than that of the other columns because the spoken languages were surveyed only in certain waves of the Microcensus.

potentially leading to different investments in children with or without citizenship. Panel A of Table 4 shows birthright citizenship increases parents' overall educational investments in the focal child, especially via material resources like a computer or books for homework.[43] Panels B and C, reveal that parents invest more in the focal child – in the form of educational resources and school-related conversations, particularly educational software and homework books (see also Table C.3 in the Appendix) – when they have only one child but investments in focal children remain unchanged in families with siblings.

However, parents' educational investments in older siblings increase substantially, outpacing investments in focal children who do not have siblings (panel D). This finding is attributable to an increase in the frequency of parental support and contact between parents and schools. Examining the individual items of these indices reveals a particular increase in the frequency of one-on-one parent-teacher meetings and increased attendance at parent-teacher conferences and parent council meetings as well as an increased support for school presentations (see Table C.3 in the Appendix). Part of the increase in support for older siblings may stem from parents' improved German proficiency, making it easier to attend school events or help with assignments.

Sibling's identity and expected discrimination. The last mechanism investigated in this paper concerns changes in siblings' attitudes and perceptions. Granting citizenship to one family member could impact the family's sense of belonging and their perception of the surrounding society and discrimination. First, I explore how siblings identify with Germany and the German society. Panel A of Table 5 shows no significant effect on siblings' identification with Germany or Germans – the coefficients are small and inconsistent. Consequently, changes in siblings' identity do not appear to explain the spillover effects on siblings' education. Panel B tests whether siblings expect discrimination in apprenticeship applications based on name, appearance, headscarf, or German skills. The analysis reveals no statistically significant effect on expected discrimination; if anything, there seems to be a slight increase, as all coefficients are positive. Hence, the focal child's citizenship does not reduce siblings' perceived labor market discrimination. It's also plausible that siblings don't expect strangers – who may not know their family's citizenship status – to treat them differently.

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[43]The sample sizes differ for the different outcome variables as they were surveyed in different waves of the NEPS (see Section 4 for a detailed description).

Table 4: Effects on Parental Investments

		Parental Investments			
	Overall (1)	Educational resources (2)	Frequency conversations (3)	Frequency support (4)	Frequency contact school (5)
Panel A: Investment in children					
Treat × Post	0.089***	0.075**	0.06	0.043	0.127
	(0.034)	(0.035)	(0.055)	(0.051)	(0.095)
N	24,805	16,158	8,371	16,283	3,864
Pre-reform Mean	2.529	2.306	2.961	2.717	1.811
Panel B: Investment in children (No siblings)					
Treat × Post	0.187***	0.289***	0.204**	0.034	0.177
	(0.057)	(0.080)	(0.092)	(0.075)	(0.107)
N	9,358	3,789	3,864	7,907	2,944
Pre-reform Mean	2.603	2.586	2.973	2.661	1.810
Panel C: Investment in children (At least one sibling)					
Treat × Post	0.040	0.023	-0.003	0.054	-0.026
	(0.041)	(0.041)	(0.081)	(0.063)	(0.184)
N	12,348	10,015	3,572	8,105	920
Pre-reform Mean	2.542	2.286	2.943	2.733	1.812
Panel D: Investment in siblings					
Treat × Post	0.286***	0.0157	0.343	0.399*	0.571***
	(0.107)	(0.134)	(0.234)	(0.210)	(0.181)
N	3169	1109	984	1980	1170
Pre-reform Mean	2.536	3.432	2.615	1.971	1.347
Min - Max	0-4	0-4	1-4	1-4	0-4

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at the school level in parentheses. All regressions control for the child's gender, the mother's age, the family's highest educational degree, the survey year, the federal state, and year × state fixed effects. Analyses of parental investments in the focal child for the child's birth month and analyses of parental investments in older siblings control for the birth order, the age difference and sibling's birth month. *Source:* National Educational Panel Study (NEPS SC3, SC4, 2010-2016).

Table 5: Effects on Sibling's Identity and Expected Discrimination

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Sibling's Identity						
	Connection with Germany	Unpleasant to be Associated with Germans	Important to be Associated with Germany	Comfortable around Germans	Part of German Society	Connectedness with Germans
Treat × Post	0.156	0.011	-0.047	0.018	-0.035	-0.088
	(0.151)	(0.081)	(0.137)	(0.103)	(0.115)	(0.078)
N	831	832	818	811	828	824
Pre-reform Mean	0.640	0.080	0.833	0.833	0.792	0.917

Panel B: Sibling's expected discrimination during applications because of...				
	Foreign Name	Foreign Appearance	Headscarf	German Skills
Treat × Post	0.066	0.042	0.111	0.084
	(0.129)	(0.113)	(0.144)	(0.080)
N	1,033	1,033	993	1,069
Pre-reform Mean	0.382	0.343	0.531	0.912

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at the school level in parentheses. All regressions control for the child's gender, the mother's age, the family's highest educational degree, the survey year, the federal state, year × state fixed effects, the birth order, the age difference and the sibling's birth month. All outcome variables are binary variables which equal 1 if the individual agrees with the statement and 0 if the individual disagrees. *Source:* National Educational Panel Study (NEPS SC4, 2011-2016).

In summary, the results reveal three channels through which birthright citizenship has spillovers on older siblings: (i) increased naturalization of siblings and parents, (ii) greater use of German at home, and (iii) increased parental investment in older siblings, without reducing support for focal children. Other possible channels – such as changes in siblings' own educational investments, support from younger siblings, a reduced need for older siblings to provide academic support to their younger siblings, or younger siblings being role models for older siblings – could also matter but are beyond the scope of available data.

5.4 Heterogeneity

This section explores effect heterogeneity to better understand the underlying mechanisms. Table C.4 presents the results for various subsamples. Panel A and B show that birthright citizenship benefits focal boys and older brothers in particular. This is noteworthy as prior research has shown that immigrant girls in Germany have higher educational attainment compared with boys (Kristen and Granato, 2007). Citizenship may help address gender differences. Additionally, older siblings benefit slightly more when the focal child is female.

Panel C reveals that spillovers are driven by older siblings who are more than 4 years (the median) older than the focal child. These siblings, aged 4 to 12 when the focal child was born, may have been more aware of the focal child's citizenship acquisition, boosting their motivation to integrate and invest in their own education.

Dahl et al. (2022) document improved well-being among boys from non-Muslim households and a decline in well-being for girls from Muslim households following the birthright citizenship reform. Building on their findings, I examine heterogeneous effects by parental country of origin, distinguishing between predominantly Muslim and non-Muslim countries.[44] The results indicate that the positive effects on focal children and their older siblings are largely driven by families originating from Muslim-majority countries. [45] Two possible explanations may account for this pattern: First, families with more precarious or uncertain immigration experiences – such as refugees from Balkan countries – may place greater value on stable prospects in the host country. Second, children from Muslim households had a lower baseline probability of completing high school on the academic track prior to the reform, leaving more room for improvement.

Panel E replicates the interaction explored in Dahl et al. (2022) – child gender and Muslim country of origin – but reveals a different pattern: effect sizes are broadly similar across subgroups, with two exceptions – focal girls and older brothers from non-Muslim households – who do not appear to experience any meaningful benefits. Additionally, I find no consistent differences in treatment effects between families from EU and non-EU countries (Panel F).[46]

Table C.5 examines five regional groups by parental[47] origin: Turkey, Eastern Europe, the Balkans, EU12, and other countries.[48] Focal children with parents from Turkey, the

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[44]A country is classified as Muslim if the majority of its population is Muslim. Children are included in this group if at least one parent migrated from a Muslim country.

[45]An analysis based on the mother's country of origin yields similar results. By contrast, the differences between Muslim and non-Muslim countries are less pronounced when using the father's origin (results available upon request).

[46]A robustness check using the mother's EU origin yields similar results. When using the father's origin instead, effects on focal children appear slightly more pronounced for EU countries (results available upon request).

[47]The results do not meaningfully differ when using the mother's versus the father's country of origin.

[48]Eastern Europe includes Moldova, Russia, Slovakia, Ukraine, Hungary, Poland, the Czech Republic, Belarus, Bulgaria, Romania, and individuals born in the Soviet Union. Albania, Bosnia, Croatia, Kosovo, Montenegro, North Macedonia, Serbia, and Slovenia are classified as Balkan countries. The EU12 countries consist of Belgium, Denmark, France, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, and the UK.

Balkans, and EU12 benefit the most. Interestingly, although children of Turkish mothers experienced the biggest increase in citizenship (see Figure 3), this did not lead to proportionally larger educational benefits. Among older siblings, the strongest effects appear for those whose parents came from the Balkans. By contrast, while focal children from EU12 families improved, their older siblings benefited not as much. A possible explanation for this discrepancy could be differing parental responses to the reform. Analyses by country of origin (available upon request), indicate that EU12 parents increased educational investments in focal children but reduced them for older siblings. This suggests a reallocation of limited resources toward the child perceived to benefit most from the reform (e.g., Becker and Tomes, 1976). In relatively well-integrated EU12 families, where baseline educational engagement was already high, the reform may have led parents to prioritize the newly entitled child over older siblings.

A key issue in Germany's citizenship debate is the regulation of dual citizenship. Until the recent reform effective June 27, 2024, most naturalizing individuals were required to renounce their previous citizenship, a known barrier to naturalization (Weinmann, 2022). Exemptions applied to migrants from EU countries, Switzerland, or states that prohibit renunciation. In Table C.6, I compare treatment effects on parents' and siblings' naturalization between these exempt groups and others to assess whether renunciation requirements deterred naturalization. Surprisingly, the treatment effects are stronger among families previously subject to the renunciation rule. One possible explanation is that, for these families, the cost of naturalizing was initially too high, but once their child or younger sibling acquired citizenship via birthright, the benefits became clearer, and outweighed the cost of giving up their original citizenship.[49] Therefore, this result cannot be seen as an overall effect of dual citizenship restrictions.

In sum, focal boys and children with Balkan or EU12 backgrounds benefited most. Spillovers were strongest for older brothers, siblings with younger sisters, siblings at least 4 years older than the focal child, and those of Balkan origin.

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[49]This is further evidenced by the data, which shows that 20-24 percent of parents naturalized only after their child was born, despite having fulfilled the residency requirement prior to birth. By the time the child finishes high school, 65 percent of parents still do not possess German citizenship. Conditional on naturalization, mothers naturalized on average 1.6 years and fathers 1.2 years after their child's birth.

5.5 Robustness of the Results

Common trend assumption. The main explanatory variable, the interaction of the treatment and post indicators, identifies the causal effect of birthright citizenship under the assumption of a common trend between treatment and control groups. Figures 4 and 5 support this, showing no significant pre-trends. Furthermore, no reforms or events took place during the study period which affected only the control or treatment group. The 2014 repeal of the "Optionspflicht", which originally required children granted citizenship via the reform to choose between German citizenship and their second nationality once they reached 18 years of age, did not affect the sample as none of the focal children was 18 by 2014.

Treatment group definition. Figure 3 reveals no first-stage effects on birthright citizenship for children with parents from Eastern European or other countries. Consequently, no effects on education or other outcomes should be anticipated for these families. Excluding these families from the treatment group produces even stronger treatment effects (Table D.7).

Control group definition. Although no visible pre-trends are detected, and there were no reforms aimed to differentially affect the control and treatment groups, time-varying policies or developments, such as the influx of other migrants, may have impacted especially children with two parents born in Germany differently than those with two parents born abroad. Additionally, native children may be unsuitable controls for outcomes like naturalization, which is universally 1 for them. To address this, I use two alternative control groups.[50] First, I define children with one German-born parent and one foreign-born parent as the control group, excluding those with two German-born parents. Results (Tables D.7 and D.8) confirm that effects on education and German usage are robust under this specification. Effects on mothers' and siblings' citizenship are also similar, while effects on fathers' citizenship status are smaller and no longer statistically significant. Second, I classify children of mothers born in (i) Eastern Europe or (ii) other countries as the control group. As I do not observe a first-stage effect for this group (see Figure 3), it constitutes a valid control group expected to evolve similarly over time. The effects

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[50]The NEPS sample size is too small to reliably apply these two approaches to outcomes related to parental investments, identity, and discrimination. While the data indicates that these variables also exhibit variation within the control group, some concerns about robustness and interpretability remain and cannot be addressed using these methods.

on focal children's educational outcomes are slightly smaller but remain statistically significant. By contrast, the effects on older siblings' education are similar in magnitude but lose statistical significance due to the substantially smaller sample size (see Table D.7). The effects on other family members' naturalization remain robust under this specification (see Table D.8), whereas no significant effects on German language usage in the household are observed.

Manipulation around the cutoff. A potential threat is strategic childbirth timing to qualify for citizenship. Such manipulation would occur if the reform had an impact on fertility rates. In general, parents had no incentive to postpone childbirth until 2000. Instead, eligible parents of children born between 1990 and 1999 could apply for German citizenship until December 31, 2000. Although fertility declined post-reform (Avitabile et al., 2014), this occurred only after 2001. Therefore, the main effects are based on the 2000 cohort and effects for later cohorts are interpreted with caution. Due to declining fertility, spillovers on younger siblings (born post-reform) cannot be assessed.

Transition rule. Some pre-2000 children received citizenship via the transition rule. Thus, some children may have been misclassified as untreated in this paper even if they received German citizenship under the transition rule. Yet, only 20% of eligible children used this rule (Felfe et al., 2020), and I scale effects accordingly. I also limit the sibling analysis to those born 1990–1998, ensuring equal exposure to this rule. Table 3 shows that the transition rule use does not explain spillovers. Excluding focal children and older siblings who benefited from the transition rule, also does not change the results (Table D.7). If it did, this would serve as an explanatory mechanism rather than a threat to the identification strategy. In an additional test, I include only older siblings born before 1990, who were therefore not affected by the transition rule. Although the estimate is less precise due to a smaller sample size, its size is even larger – likely due to a larger age difference between siblings.

Residency requirement. The reform required that the child must be born after 2000 and that at least one parent must have resided in Germany for a minimum of eight years and held a legal residence title at the time of the child's birth. In the main specifications, I focus solely on the timing of childbirth, rather than the length of the parents' residency due to (i) substantial measurement error in the residency variable, (ii) data availability

limited to cohabiting parents, and (iii) the absence of information regarding legal residency titles in the Microcensus. As a robustness check, I exclude children whose parents don't meet the residency criterion. The results presented in Table D.7 indicate that this exclusion does not alter the estimated effects.

Sample selection (household residence). The Microcensus only includes co-residing individuals, which excludes older siblings who moved out of the parental household. Therefore, my analysis shows the effects of birthright citizenship on older siblings completing the academic track while living in the parental household. The sample exclusion may bias estimates if residential mobility is correlated with education. To address this, I conduct a bounding analysis following Felfe et al. (2020). I boost the sample by incorporating the average share of individuals not living in the parental household by age group according to official statistics (Statistisches Bundesamt, 2024).[51] I then estimate the effects under four scenarios that assign academic track completion outcomes to these unobserved individuals: (i) none of the added individuals in either the treatment or control group complete the academic track, (ii) added individuals in the treatment group do not complete, while those in the control group do, (iii) added individuals in the treatment group complete, while those in the control group do not, and (iv) all added individuals in both groups complete the academic track. Under these varying assumptions, the estimated spillovers remain sizable and statistically significant in all cases except the scenario where all added treatment group observations are assigned academic track completion and all added control group observations are assigned non-completion (Table D.9).[52] Therefore, sample selection should not drive the estimated treatment effects.

Return migration. Sajons (2016) shows that a child's citizenship access reduces family out-migration. Thus, the treatment group in the post period of my analysis could include families which would otherwise have left Germany, making them less comparable to families in the pre-period. However, families with children born before and after the birth

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[51]2.7% for 17-year-olds, 7.1% for 18-year-olds, 17.0% for 19-year-olds, 27.9% for 20-year-olds, and 38.6% for 21-year-olds.

[52]To understand these estimated bounds compared to the main estimate, it is useful to consider how the group means respond to the artificial assignment of outcomes. Although I assign the same proportion of added observations to both treatment and control groups, the control group has a higher baseline academic track completion rate. As a result, assigning 1 to the treatment observations and 0 to the control observations reduces the observed treatment effect, because the increase in the treatment group's mean is smaller than the decrease in the control group's mean. Conversely, assigning 0 to the treatment observations and 1 to the control observations maximizes the estimated treatment effect.

date cutoff seem to be similar in predetermined characteristics (see Table A.1), mitigating this concern.

Placebo test. To rule out the possibility that my effects are driven by unobservable characteristics or underlying trends, I perform two placebo reform tests. The first employs the same event study approach and time period as in the main specification, while comparing two subgroups within the control group: children with one foreign-born parent and one German-born parent with children with two German-born parents. Both groups received German citizenship at birth due to their parents' citizenship; thus, the reform should not have affected them differently. Figures D.1 and D.2 in the Appendix show that no significant effect was observed in this placebo treatment group. The second test is based on the same treatment and control groups as in the main specification, but employs January 1, 1996, as the reform cutoff. These analyses shown in Figures D.3 and D.4 cannot detect any effects for this placebo reform.[53] These two tests strengthen the common trend assumption.

Controlling for household income. Parents' financial investments may increase due to higher household income connected to the focal child's citizenship. However, the effects on parents' investments remain robust even after controlling for household income.[54]

Standard errors. I test robustness to clustering standard errors: at the birth month/ year level and at the family level – as multiple focal children and older siblings can be included in the sample. Both tests confirm statistical significance of the results (see Table D.7).

6 Conclusion

This paper investigates the spillover effects of Germany's birthright citizenship reform on older siblings of children who received citizenship at birth. It demonstrates that access to birthright citizenship increases immigrant children's probability of completing the academic secondary track by 13-16 percentage points, which is a smaller effect size compared with medium-term effects identified in previous studies (19 pp., Felfe et al.,

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[53]The coefficients for the effects on siblings are less precisely estimated for the birth cohorts 1991-1991 as they are based on fewer siblings.

[54]The results are available from the author upon request.

2020).[55] The reform also benefits older siblings, raising their likelihood of obtaining a university entrance qualification by about half as much. As a comparison: Karbownik and Oezek (2023) find siblings spillover effects of educational achievements with a magnitude that is 30% of the magnitude of the direct effects on focal children.

The spillovers are partly driven by increased naturalization among parents and, even more so, older siblings, who appear to pursue citizenship independently after becoming aware of differences in nationality within the family. There likely also is an increase in German usage at home – although this is not robust across all specifications – impacting children's German proficiency and parents' ability to support their children academically. I additionally provide suggestive evidence that parents increase investments in older siblings while maintaining support for the focal child. These findings reveal that parents recognize the benefits of German citizenship and strategically adjust both naturalization and educational investments, treating them as substitutes and aiming to equalize opportunities (Berry et al., 2020; Heckman and Mosso, 2014). They may also update beliefs about long-term prospects in Germany, raising expectations for educational returns and investing more in older siblings (Becker, 1962).

Heterogeneity analyses highlight the importance of the migration context. While birthright citizenship increased most among children with Turkish parents, educational gains were larger for children from Balkan families, many of whom arrived as refugees fleeing the war in former Yugoslavia (Alscher et al., 2015). As Fasani et al. (2024) show, citizenship has a greater impact on the labor market outcomes of forced migrants, likely because their integration takes generally longer. For refugee families, citizenship may represent stability. Additionally, educational gains were similar for non-EU and EU migrant families, even though non-EU children gained broader EU labor market access. This supports findings by Govind and Sirugue (2023) that EU migrants are likelier to naturalize in France than non-EU migrants despite limited direct benefits, suggesting that citizenship carries symbolic value beyond legal rights.

These findings confirm that early access to citizenship has significant benefits, greater than previously estimated. These benefits ar important with respect to educational in-

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[55]Felfe et al. (2020) restrict the sample to children born in 1999 and 2000 and therefore their effect size corresponds to my effect size of 16 percentage points which I find for the sample of children born 1999-2000.

equalities and talent shortages in the long run (see e.g. OECD, 2023b). They also highlight the relevance of current debates in Germany and elsewhere on citizenship reforms. The new German law of June 27, 2024 – which reduces the residency requirement – may also enhance educational outcomes for children and siblings. The results are also relevant for countries like the U.S., where older siblings who immigrate after birth might still benefit despite not having citizenship themselves.

Finally, it is important to note that the studied families immigrated at least 8 years before the child's birth and stayed through the end of secondary school – indicating a strong intention to remain and integrate. These findings may not apply to more recent migrants with no intention to stay. Future research should additionally assess labor market impacts as these children enter employment, determining whether these reforms can effectively address the demand for highly skilled labor.

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Migration und Fluechtlinge (BAMF) Forschungszentrum Migration, Integration und Asyl.

Appendices

A Additional Descriptives

Table A.1: Comparison of Pre- and Post-Reform Groups

	Pre	Post
	1994-1999	2000-2002
	Mean/Percentage	
Focal Child is male	51.93 %	52.00 %
Birth month (focal child)	6.54 (3.39)	6.26 (3.39)
Birth year (focal child)	1996.86 (1.63)	2000.8 (0.79)
Older sibling's age (in years)	19.22 (1.58)	19.1 (1.61)
Age difference between siblings (in years)	3.33 (1.64)	5.11 (2.29)
Mother's age at birth (in years)	27.53 (4.27)	27.38 (4.38)
Highest post-secondary degree in the household		
No degree	11.91 %	13.02 %
Vocational training	57.42 %	57.31 %
University	26.0 %	26.22 %
Missing	4.67 %	3.45 %
Mother's region of origin		
German	75.19 %	72.32 %
Turkey	8.04 %	9.73 %
Eastern Europe	1.35 %	1.74 %
Balkan	2.16 %	2.86 %
Eu 12	2.09 %	2.37 %
Other	4.6 %	5.19 %
Missing	6.57 %	5.78 %
Father's region of origin		
German	63.87 %	60.61 %
Turkey	7.37 %	9.16 %
Eastern Europe	0.77 %	1.03 %
Balkan	2.0 %	2.82 %
Eu 12	2.3 %	2.45 %
Other	3.84 %	4.52 %
Missing	19.84 %	19.41 %
Observations	60,651	29,364

Note: Standard deviation in parentheses. The statistics are based on the sample of households with older siblings born 1990-1998 and a focal child born 1994-2002. "Pre" includes all older siblings with a focal child born 1994-1999 and "post" includes all older siblings with a focal child born 2000-2002. *Source:* German Microcensus (2010-2021).

B First Stage

Table B.2: First Stage

	Focal Child Sample		Sibling Sample	
	Focal Child Birth Cohorts			
	1992-2002	1999-2000	1994-2002	1999-2000
	(1)	(2)	(3)	(4)
Post	0.358***	0.248***	0.365***	0.326***
	(0.007)	(0.014)	(0.009)	(0.016)
Observations	24,978	5,157	12,243	3,661

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses. Post equals 1 for all children born since 2000 and 0 for all children born until 1999. The regressions only include children in the treatment group (children born to two parents who were born abroad and immigrated). *Source:* German Microcensus (2010-2021).

C Detailed and Subsample Analyses

Table C.3: Effects on Parental Investments (Detailed Analysis)

	Parental Investments			
	(1)	(2)	(3)	(4)

Panel A: Investment in children (no siblings): Educational resources

	Desk	Educational Software	Books for Homework	Computer
Treat × Post	0.022	0.133**	0.144***	0.014
	(0.031)	(0.054)	(0.052)	(0.015)
N	3,252	3,209	3,241	3,156
Pre-reform Mean	0.941	0.491	0.718	0.973
Min - Max	0-1	0-1	0-1	0-1

Panel B: Investment in children (no siblings): Frequency conversations about...

	Curriculum	Difficulties in School		
Treat × Post	0.226*	0.176*		
	(0.117)	(0.097)		
N	3,857	3,855		
Pre-reform Mean	2.855	3.092		
Min - Max	1-4	1-4		

Panel C: Investment in siblings: Frequency of support with...

	Buying Study Material	Support with Presentations		
Treat × Post	0.043	0.415*		
	(0.361)	(0.219)		
N	810	1,980		
Pre-reform Mean	2.5	1.863		
Min - Max	1-4	1-4		

Panel D: Investment in siblings: Frequency of contact with the school

	Parent-teacher conferences	Talks with Teachers	Parents Council	Help with School Events
Treat × Post	0.510	0.851***	0.638**	0.187
	(0.328)	(0.245)	(0.280)	(0.250)
N	1,113	1,167	1,167	1,130
Pre-reform Mean	3.533	2.161	1.645	2.167
Min - Max	0-4	0-4	0-4	0-4

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at the school level in parentheses. All regressions control for the child's sex, the mother's age, the family's highest educational degree, the survey year, the federal state, and year × state fixed effects. Analyses of parental investments in the focal child control for the child's birth month and analyses of parental investments in older siblings control for the birth order, age difference and sibling's birth month. *Source:* National Educational Panel Study (NEPS SC3, SC4, 2010-2016).

Table C.4: Effects on Focal Child's and Sibling's Academic School Track Completion - For Different Subsamples

	Focal Child		Older Sibling	
	(1)	(2)	(3)	(4)
Panel A: By Focal Child's Gender				
	Female	**Male**	**Female**	**Male**
Treat × Post	0.037*** (0.010)	0.058*** (0.010)	0.028** (0.013)	0.016 (0.013)
Observations	154,746	152,748	43,303	46,712
Mean	0.747	0.668	0.727	0.651
Panel B: By Older Sibling's Gender				
			Female	**Male**
Treat × Post			0.018 (0.013)	0.023* (0.013)
Observations			43,472	46,543
Mean			0.689	0.686
Panel C: By Age Difference Between Siblings				
			Below median	**Above median**
Treat × Post			0.016 (0.017)	0.031** (0.012)
Observations			46,535	43,480
Mean			0.712	0.662
Panel D: By Parents' Country of Origin: Non-muslim vs. Muslim				
	Non-Muslim	**Muslim**	**Non-Muslim**	**Muslim**
Treat × Post	0.027** (0.012)	0.040*** (0.009)	0.010 (0.017)	0.019* (0.011)
Observations	286,801	295,483	79,813	85,976
Mean	0.712	0.708	0.699	0.689
Panel E: By Parent's Country of Origin: Non-muslim vs. Muslim and Gender				
	Non-Muslim	**Muslim**	**Non-Muslim**	**Muslim**
		Girls		
Treat × Post	0.004 (0.017)	0.039*** (0.012)	0.018 (0.024)	0.018 (0.015)
Observations	144,213	148,688	37,929	41,350
Mean	0.752	0.748	0.743	0.730
		Boys		
Treat × Post	0.047*** (0.017)	0.042*** (0.013)	-0.001 (0.023)	0.020 (0.016)
Observations	142,588	146,795	41,884	44,626
Mean	0.671	0.668	0.660	0.651
Panel F: By Parents' Country of Origin: Non-EU vs. EU				
	Non-EU	**EU**	**Non-EU**	**EU**
Treat × Post	0.035*** (0.010)	0.038** (0.016)	0.016 (0.010)	0.022 (0.024)
Observations	299,709	282,575	87,847	77,942
Mean	0.708	0.711	0.689	0.699

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses. The treatment group includes all children born to two parents who were born abroad and immigrated. The control group includes all children with at least one parent born in Germany. All regressions include year and state fixed effects, year*times*state fixed effects, the child's gender, the mother's age at birth, the family's highest educational degree and the focal child's birth month; columns 3 and 4 also control for the birth order, the age difference between siblings, and the sibling's birth month. *Source:* German Microcensus (2010-2021).

Table C.5: Effects on Focal Child's and Sibling's Academic School Track Completion - by Parents' Region of Origin

| | Focal Child | | Older Sibling | |
| | Non-Muslim | Muslim | Non-Muslim | Muslim |
	(1)	(2)	(3)	(4)
Panel A: By Mother's Region of Origin				
	Turkey	**Eastern Europe**	**Turkey**	**Eastern Europe**
Treat × Post	0.038*** (0.011)	-0.007 (0.026)	0.017 (0.013)	0.006 (0.039)
Observations	290,515	279,018	83,347	76,818
Mean	0.708	0.712	0.691	0.701
	Balkan	**EU 12**	**Balkan**	**EU 12**
Treat × Post	0.064*** (0.019)	0.064*** (0.023)	0.054** (0.025)	0.029 (0.032)
Observations	281,016	280,160	77,828	77,230
Mean	0.711	0.711	0.698	0.699
	Other		**Other**	
Treat × Post	0.016 (0.014)		0.002 (0.018)	
Observations	282,838		79,117	
Mean	0.714		0.702	
Panel B: By Father's Region of Origin				
	Turkey	**Eastern Europe**	**Turkey**	**Eastern Europe**
Treat × Post	0.027** (0.011)	0.031 (0.028)	0.029** (0.013)	0.034 (0.043)
Observations	289,323	278,635	82,812	76,736
Mean	0.709	0.712	0.691	0.701
	Balkan	**EU 12**	**Balkan**	**EU 12**
Treat × Post	0.058*** (0.020)	0.066*** (0.024)	0.064** (0.026)	0.010 (0.033)
Observations	280,614	279,902	77,715	77,161
Mean	0.711	0.711	0.698	0.700
	Other		**Other**	
Treat × Post	0.002 (0.014)		-0.009 (0.018)	
Observations	282,259		78,907	
Mean	0.713		0.702	

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses. The treatment group includes all children born to two parents who were born abroad and immigrated. The control group includes all children with at least one parent born in Germany. All regressions include year and state fixed effects, the child's gender, the mother's age at birth, the family's highest educational degree and the focal child's birth month; columns 3 and 4 also control for the birth order, the age difference between siblings and the sibling's birth month. *Source:* German Microcensus (2010-2021).

Table C.6: Effects on Naturalization of Family Members – by Dual Citizenship Restrictions

	Mother (1)	Citizenship Father (2)	Sibling (3)	Transition Rule Sibling (4)
Panel A: Dual Citizenship Restricted				
Treat × Post	0.027*** (0.006)	0.017** (0.007)	0.034*** (0.009)	-0.006** (0.003)
Observations	590,159	479,155	181,769	181,769
Pre-reform Mean	0.345	0.400	0.577	0.037
Panel B: Dual Citizenship not Restricted				
Treat × Post	0.008 (0.010)	0.010 (0.012)	0.021 (0.020)	-0.005 (0.005)
Observations	408,180	434,907	159,885	159,885
Pre-reform Mean	0.215	0.241	0.390	0.013

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses. The treatment group includes all children born to two parents who were born abroad and immigrated. The control group includes all children with at least one parent born in Germany. All regressions include year and state fixed effects, year*times*state fixed effects, the focal child's gender, the mother's age at birth, the families highest educational degree and the focal child's birth month, columns 3-5 also include the birth order, the age difference between siblings, and the sibling's birth month as controls. The outcome variable "Citizenship" captures whether the mother (col. 1), the father (col. 2) or the older sibling (col. 3) has German citizenship at the time of the survey and "Transition rule" indicates whether individuals made use of the transition rule described in Section 2. This is a binary variable which equals 1 for individuals who are born before 2000 and who received their German citizenship in 2000 or 2001 (as 89% of children who benefited from the rule naturalized in 2000 or 2001, see Worbs, 2008). *Source:* German Microcensus (2010-2021).

D   Robustness

Table D.7: Effects on Focal Child's and Older Sibling's Academic School Track Completion - Robustness Tests

	Focal Child (1)	Older Sibling (2)
Main estimate	0.047*** (0.007)	0.021** (0.009)
Observations	307,494	90,015
Treatment group:		
Excl. Eastern Europe & other countries	0.054*** (0.008)	0.026** (0.011)
Observations	293,784	84,576
Control group:		
1 German-born & 1 foreign-born parent	0.033*** (0.010)	0.044*** (0.014)
Observations	51,775	20,387
Control group:		
Eastern Europe & other countries	0.038** (0.015)	0.027 (0.019)
Observations	27,052	13,155
Excl. focal children using transition rule	0.049*** (0.007)	0.024*** (0.009)
Observations	306,643	89,657
Excl. siblings using transition rule		0.023** (0.009)
Observations		89,451
Only siblings born before 1990		0.073 (0.065)
Observations		364
Excl. families <8 years residency at birth	0.049*** (0.008)	0.017* (0.010)
Observations	298,645	87,297
SE clustered at birth month-year level	0.047*** (0.009)	0.021** (0.011)
Observations	307,494	90,015
SE clustered at family level	0.047*** (0.008)	0.021* (0.011)
Observations	307,494	90,015
Sample with citizenship information	0.056*** (0.008)	0.030*** (0.010)
Observations	302,194	88,446

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses (clustered standard errors in specifications 9 and 10). The treatment group includes all children born to two parents who were born abroad and immigrated. The control group includes all children with at least one parent born in Germany. All columns include year and state fixed effects, year$times$state fixed effects, the focal child's gender, the mother's age at birth, the families highest educational degree and the focal child's birth month, columns 3 and 4 also control for the birth order, the age difference between siblings, and the sibling's birth month. *Source:* German Microcensus (2010-2021).

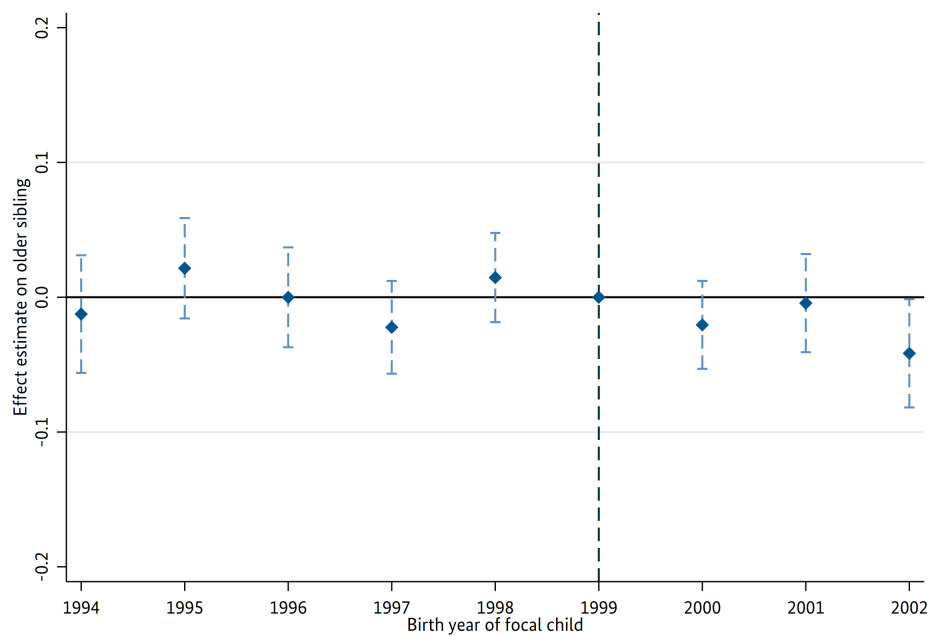Table D.8: Effects on Naturalization of Family Members and German Language Usage - Alternative Control Groups

	Mother (1)	Citizenship Father (2)	Sibling (3)	Transition Rule Sibling (4)	German in the Household (5)
Main estimate	0.025***	0.018***	0.038***	0.001	0.036***
	(0.006)	(0.007)	(0.013)	(0.005)	(0.012)
Observations	604,774	491,640	62,596	62,596	51,566
1 German-born & 1 foreign-born parent	0.057***	0.003	0.029***	-0.006**	0.046***
	(0.008)	(0.009)	(0.009)	(0.003)	(0.016)
Observations	128,228	107,285	46,106	46,106	14,705
Eastern Europe & other countries	0.066***	0.042***	0.038**	-0.001	-0.045
	(0.013)	(0.012)	(0.017)	(0.006)	(0.030)
Observations	76,255	67,716	30,980	30,980	8,225

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses. The treatment group includes all children born to two parents who were born abroad and immigrated. The control group includes all children with at least one parent born in Germany. All columns include year and state fixed effects, year$\times$state fixed effects, the focal child's gender, the mother's age at birth, the families highest educational degree and the focal child's birth month, columns 3-5 also control for the birth order, the age difference between siblings, and the sibling's birth month. *Source:* German Microcensus (2010-2021).

Table D.9: Effects on Older Sibling's Academic School Track Completion - Bounds

	Treat 0 Control 0 (1)	Treat 0 Control 1 (2)	Treat 1 Control 0 (3)	Treat 1 Control 1 (4)
Treat × Post	0.024***	0.026***	0.013	0.014*
	(0.009)	(0.009)	(0.009)	(0.008)
Observations	103,907	103,907	103,907	103,907

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses. The treatment group includes all children born to two parents who were born abroad and immigrated. The control group includes all children with at least one parent born in Germany. All columns include year and state fixed effects, year$\times$state fixed effects, the focal child's gender, the mother's age at birth, the families highest educational degree and the focal child's birth month, the birth order, the age difference between siblings, and the sibling's birth month. *Source:* German Microcensus (2010-2021).

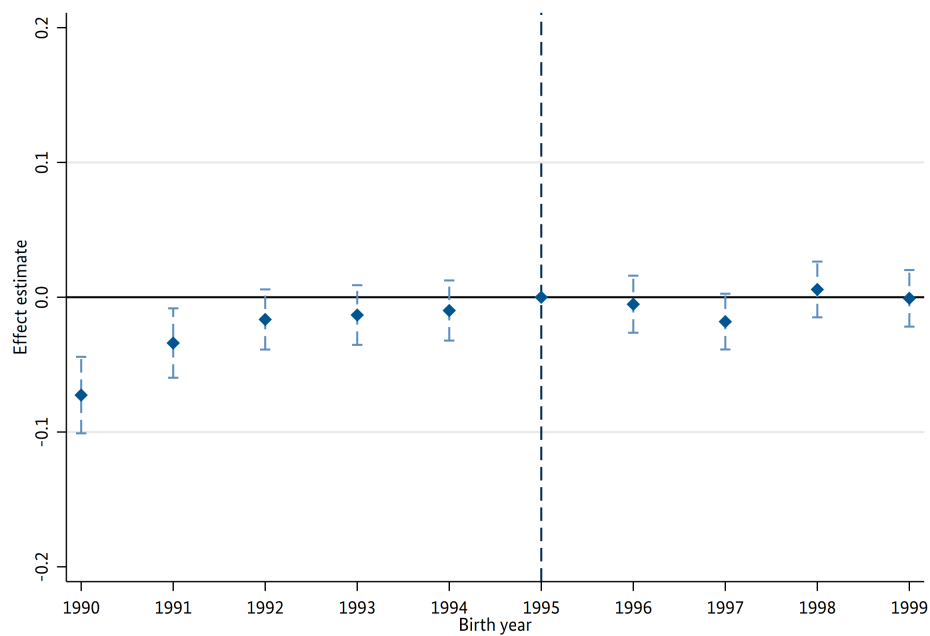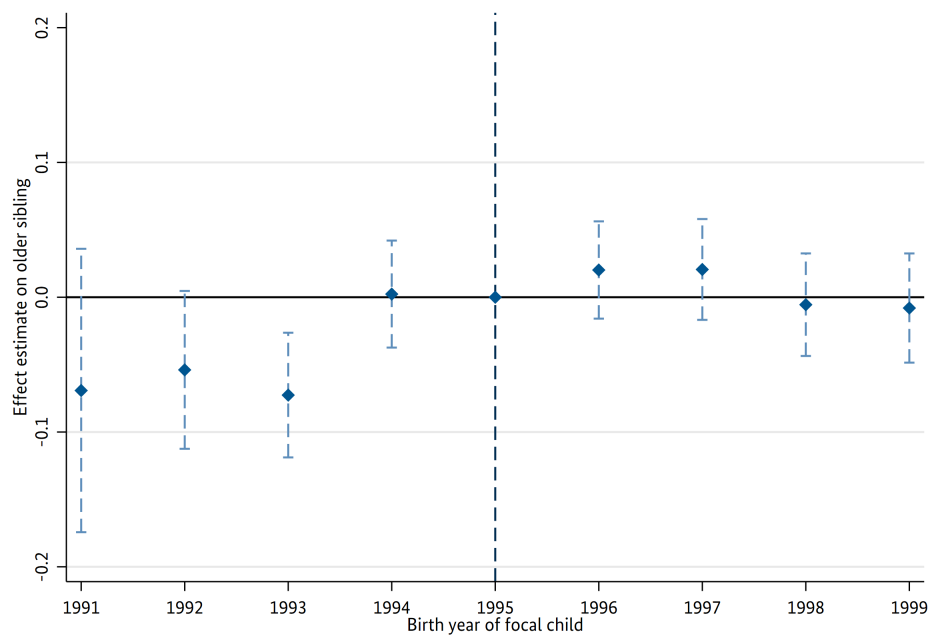Figure D.1: Effect on Focal Children's Academic School Track Completion: Placebo Treatment Group
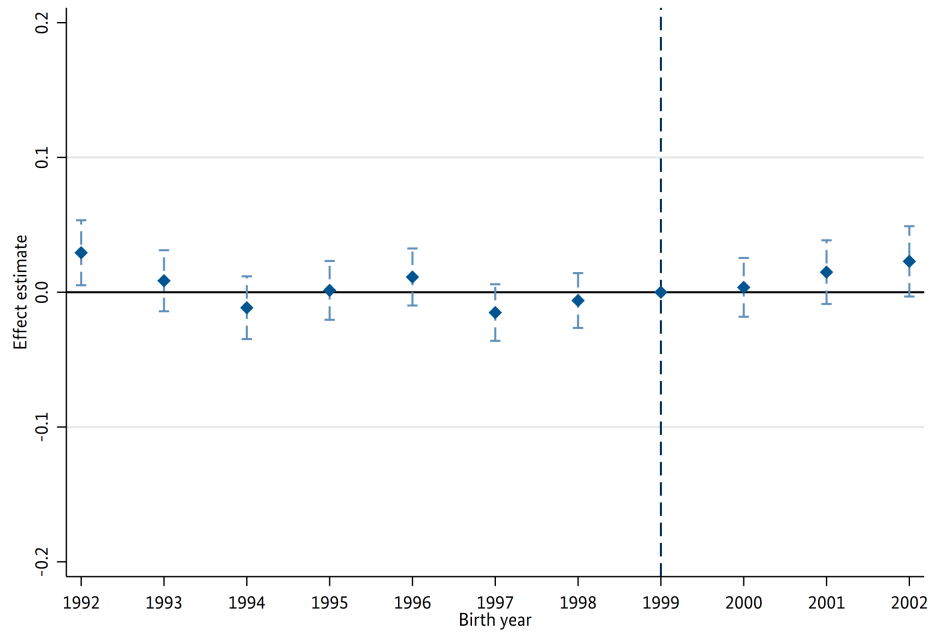
Note: These coefficients are estimated using the event study approach described in equation 1. The figure displays the coefficients of the interaction of the treatment variable $Treat_i$ with the birth cohorts compared to the last pre-reform year 1999. The outcome variable captures whether the individual (aged 17-22) either obtained a university entrance qualification or currently attends a school track leading to university entrance qualification. The treatment group includes children with one German-born and one foreign-born parent. The control group includes children with two German-born parents. The regression includes year and state fixed effects, year$\times$state fixed effects, the focal child's gender, the mother's age at birth, the families highest educational degree and the focal child's birth month. N=277,299. 90% confidence intervals based on robust standard errors shown. *Source:* German Microcensus (2010-2021).

Figure D.2: Effect on Siblings' Academic School Track Completion: Placebo Treatment Group

Note: These coefficients are estimated using the event study approach described in Equation 1. The figure displays the coefficients of the interaction of the treatment variable $Treat_i$ with the focal child's birth cohorts compared to the last pre-reform year 1999. The outcome variable captures whether the sibling (aged 17-22) either obtained a university entrance qualification or currently attends a school track leading to university entrance qualification. The treatment group includes children with one German-born and one foreign-born parent. The control group includes children with two German-born parents. The regression includes year and state fixed effects, year$times$state fixed effects, the focal child's gender, the mother's age at birth, the families highest educational degree, the focal child's birth month, the birth order, the age difference between siblings, and the sibling's birth month. N=76,237. 90% confidence intervals based on robust standard errors shown. *Source:* German Microcensus (2010-2021).

Figure D.3: Effect on Focal Children's Academic School Track Completion: Placebo Reform 1996

Figure D.4: Effect on Siblings' Academic School Track Completion: Placebo Reform 1996