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Abstract

Immigrant children often face educational disadvantages that stem from their parents' decision-making. For example, in many immigrant-receiving countries, immigrants are less likely than the native-born to enrol their children in preschool programs or enable them access to higher education. Thus, a key question is how to get immigrant parents to provide their children with similar educational opportunities as children in native families. This paper examines whether the introduction of birthright citizenship in Germany caused immigrant parents to adapt their educational choices for their offspring. We employ a difference-in-differences strategy which exploits a birth date cut-off determining whether a child became eligible for birthright citizenship or not. We find that the policy caused immigrant parents to (i) send their children to preschool more often; (ii) enrol their children earlier in primary school; and (iii) adjust their secondary school track choices in a way that enables their children better access to higher education.

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1. Introduction

Children with migrational backgrounds are among the fastest growing segments of the population in many countries across the developed world. Thus, they will play an important role in shaping the economic future of these societies. While immigrant families bring many strengths to their host countries, they also present serious policy challenges. A core concern, hotly debated by scholars and policymakers alike, is the educational performance of immigrant children. In particular, although there are some OECD countries where children of immigrants do educationally at least as well as children of the native-born, there are many others where they are, on average, outperformed by their peers in school. In Europe, for example, a good deal of evidence points to a substantial immigrant disadvantage in multiple indicators of academic achievement.[1]

Many experts attribute this apparent educational disadvantage of immigrant children to their parents' circumstances and behavior. In particular, children with migrational backgrounds often reside in linguistically and socially isolated families where parents have difficulty speaking the language of the host society or lack socioeconomic status. These factors make it difficult for parents to acquire important practical knowledge of how education systems work and undermine their ability to effectively interact with schools and other institutions that improve the development of their children. As a consequence, the educational choices immigrant parents make for their children differ systematically from those of their native counterparts. For example, in many OECD countries, immigrant parents are substantially less likely than native-born parents to enrol their children in preschool programs or to enable them access to higher education.

These issues prompt a fundamental question: How can policymakers incenitvize immigrant parents to provide their children with similar educational opportunities as children of the native-born? We address this question by examining an increasingly common, yet still contentious, intervention in many immigrant-receiving countries: the granting of *birthright citizenship*, so that children born to foreign parents *automatically* acquire the nationality of the host country at birth. We exploit a natural experiment in Germany which saw the introduction of such a policy and evaluate whether it caused immigrant parents to adjust their educational choices for their offspring. In so doing, we take a dynamic view of the education process and focus on the first three critical decisions parents have to make in the German education system: *preschool enrolment*, *timing of primary school entry*, and *choice of secondary school track*. Our study is among the first to exploit exogenous policy variation in order to identify causal factors underlying the educational integration of immigrant children, which we view as our main contribution.

1. A comparison of the educational attainment of second-generation immigrants with that of children born to native parents is provided by Dustmann et al. (2012) and Riphahn (2003).

Birthright citizenship and immigrant parents' educational choices might be linked because citizenship rights are a basis for political and professional equality and thus likely to enhance immigrant children's future labor market opportunities. For example, there is evidence that naturalized immigrants earn more than non-naturalized ones (Chiswick, 1978; Steinhardt, 2012), have higher job-finding rates (Fougère and Safi, 2009; Gathmann and Keller, 2014) and experience steeper wage-tenure profiles (Bratsberg et al., 2002). Thus, the introduction of birthright citizenship represents a positive shock to the long-run rate of return on parental investments in children's human capital. Moreover, immigrant parents might have the perception that schools or employers are less likely to discriminate against their naturalized children, and as a consequence might adjust their educational choices.

The citizenship reform we examine was introduced in Germany at the turn of the millennium; it essentially constituted a change from *ius sanguinis* ("right of blood") to *ius soli* ("right of soil"). Under *ius sanguinis*, only descendants of home-country nationals receive citizenship. By contrast, under *ius soli*, every individual born on the national territory becomes eligible for citizenship. The German reform allows us to exploit one particular feature:[2] all children born to foreign parents from 1st January 2000 onwards were *automatically* granted citizenship if at least one parent had been a legal resident in Germany for at least eight years at the time of birth. This setting provides us with a birth date cut-off regarding the entitlement to automatic birthright citizenship, which allows to overcome problems of endogeneity. Our identification strategy rests on a difference-in-differences design (DiD) which not only compares immigrant children born shortly before and shortly after the cut-off date, but also draws upon immigrant children from adjacent birth cohorts as a control group. This approach allows us to net out possible seasonal and age effects.

In the German education system, there are essentially three parental decisions to be made: (i) whether to enrol a child in *preschool*; (ii) when to enrol a child for compulsory *primary school*; and (iii) which educational track a child will follow in *secondary school*. In making the latter two decisions, parents can draw upon official recommendations by pediatricians and teachers. In particular, prior to primary school enrolment, pediatricians assess a child's "school readiness" and may recommend deferred school entry. In a similar vein, teachers make a recommendation for a child's secondary school track in the final year of primary school. The main secondary school tracks are: secondary general school ("Hauptschule"), intermediate school ("Realschule") or high school ("Gymnasium"). The context of our study is Schleswig Holstein—a federal state in Germany where the recommendations of pediatricians and teachers are *non-binding*. Thus, the ultimate timing of primary school enrolment and the choice of secondary school track is at the discretion of parents.

Against this background, our central question is: Did the introduction of automatic birthright citizenship affect immigrant parents' decisions regarding their children's

2. The reform also changed other features of Germany's nationality law, which we discuss in Section 3.1.

education? As our results suggest an affirmative answer to this question, we additionally ask: What was the role of pediatricians' and teachers' recommendations in immigrant parents' decision-making process. Finally, we provide some evidence on the reform's effect on immigrant children's developmental and schooling outcomes, but data limitations prevent us from delving deeply into this issue.

The German federal state of Schleswig-Holstein provides an ideal setting to address these questions. On the one hand, during the period we study, Schleswig-Holstein was one of five federal states in Germany where parents were not obliged to follow the educational recommendations of pediatricians and primary school teachers; the educational decisions we are interested in was at their discretion. On the other hand, it is the only federal state that provides administrative school data across all relevant levels of education. To this end, we draw upon two large and unique datasets. First, we use administrative records from school entrance examinations. These records contain several measures of child development as well as physicians' assessments of children's school readiness at age six. An accompanying questionnaire, filled out by parents, provides information on children's previous preschool enrollment and family background. We use the records of immigrant children born between July 1998 and June 2001 and examined for school entrance between 2005 and 2007. Second, we rely on administrative school registers. These registers contain information on primary teachers' track recommendations as well as children's enrollment in the three tracks of secondary school. We use school registers for the period from 2009 to 2012. During that period, the cohorts under study were enrolled in secondary school.

We obtain three sets of results. First, we provide evidence on the effects of automatic birthright citizenship during the *preschool* period. Here our key result is that the policy has a significant effect on the enrollment decisions of immigrant parents: the proportion of immigrant children attending non-mandatory preschool rises by 3.5%. Interestingly, this effect appears to close the enrollment gap between native and immigrant children completely. Turning to developmental outcomes measured at the end of the preschool period, we find positive and significant effects on immigrant children's emotional-behavioral development. Finally, we also find that the reform had a sizeable positive effect on immigrant children's German language proficiency, but this estimate lacks precision due to a very small sample size.[3]

Second, we document the impacts of birthright citizenship during the *primary school* phase. On one side, we find no effect on pediatricians' recommendations regarding immigrant children's school readiness. However, despite these unchanging recommendations, the policy causes immigrant parents to enrol their children earlier in primary school: the average school starting age of immigrant children decreases by 0.7 months, which leads to an increase in the incidence of early age schooling by 59%.

3. As we will explain in more detail below, our estimation sample for emotional-behavioral development measures covers all immigrant children residing in Schleswig-Holstein, while that for German language proficiency only covers children from a single city (Luebeck).

As regards educational outcomes, we find some evidence pointing to a reduction in the probability of grade repetition among immigrant children.

Our final set of results sheds light on the reform's effects during the *secondary school* phase. The patterns we unearth here are consistent with those at the primary school stage. We find no effect on teachers' recommendations regarding immigrant children's secondary school track. In particular, the likelihood of immigrant children receiving a recommendation for the academic track of secondary school is unaffected. However, the introduction of birthright citizenship nevertheless causes immigrant parents to adjust their secondary school track choices: the proportion of immigrant children attending the academic track of secondary school *without* an official recommendation rises by 47%. This effect reduces the academic-track enrollment gap between native and immigrant children by 19%.

The remainder of the paper is organized as follows. In the next section, we provide a review of the related literature and discuss how our study contributes to it. Section 3 describes the institutional background. Section 4 introduces the empirical strategy. Section 5 describes the data used for the analysis. Section 6 presents the main results and provides a series of sensitivity checks. Section 7 concludes.

2. Related Literature

Our study is connected to two strands of literature. The first deals with the educational integration of immigrant children. Several studies have looked at the educational attainment of immigrant children in comparison to natives, both from a within-country and a cross-national perspective. This research is summarized by Dustmann et al. (2012). Across OECD countries, there is considerable heterogeneity in immigrant children's educational achievements (see, e.g., Entorf and Minoiu, 2005; Algan et al., 2010). In countries where immigrant children are outperformed by their peers (e.g., in Continental Europe), the achievement gap is associated with factors such as family background, language spoken at home and educational tracking (see, e.g., Schnepf, 2007; Akresh and Akresh, 2011; Dustmann et al., 2012; Lüdemann and Schwerdt, 2013). In the United States, an additional factor for the low educational attainment of some groups of immigrant children (e.g., those of hispanic origin) is the low quality of schools which they attend (Wells, 2009).[4] Currie and Thomas (1999) provide evidence that participation in *Head Start*—a preschool program in the United states—closes one-forth of the gap in test scores between hispanic children and non-hispanic white children, and two-thirds of the gap in the probability of grade repetition.

4. This factor is also relevant in Europe (Dronkers and Levels, 2007), but the quality variation between European schools is smaller than that of schools int the United states (Scheerens and Bosker, 1997).

The second strand of related literature explores the effects of granting citizenship to immigrants. Chiswick (1978) was among the first contributors to this literature. He considers the effect of americanization on the earnings of foreign-born men. More recent contributions have generated insights into the effects of citizenship on wage growth (Bratsberg et al., 2002; Steinhardt, 2012), employment prospects (Fougère and Safi, 2009; Gathmann and Keller, 2014) and remittances (Piracha and Zhu, 2012). That said, with the exception of Gathmann and Keller (2014), these studies cover periods with no exogenous policy variation. Turning to the effects of *birthright* citizenship, there is evidence hat foreign-born parents are more likely to interact with the local community and use the language of the host country if their children are entitled to citizenship at birth (Sajons, 2012; Avitabile et al., 2013). Granting citizenship to immigrant children also reduces the likelihood of return migration for their parents (Sajons, 2016). Finally, exploiting the same reform as we do, Avitabile et al. (2014) find that birthright citizenship leads to a reduction in immigrant fertility and improved health outcomes for immigrant children.

In this paper, we take a first step towards connecting these two literature by asking whether birthright citizenship affects the way immigrant parents take influence on the education of their children. Our main contribution is twofold. On the one hand, we are among the first to exploit exogenous policy variation in order to identify causal factors underlying the educational integration of immigrant children. In contrast, most existing studies employ decomposition methods to analyze factors responsible for the achievement gap between immigrant children and their non-immigrant peers. On the other hand, we recognize that education is a dynamic process that proceeds in stages, and therefore provide a nuanced picture of the effects of birthright citizenship as immigrant children go through the first three critical stages of this process (i.e., preschool, primary school and secondary school). Previous work has typically focused on one stage of this process in isolation. For example, much of the literature examining attainment gaps between immigrant and non-immigrant children focuses on the secondary education stage.

3. Background

3.1. Reform of the Nationality Law in 1999

In May 1999, after a long and heated debate over how to deal with the rising number of immigrants, the German parliament undertook a major revision of the "German Citizenship and Nationality Law" dating back to 1913. On 15th July 1999, the German parliament ratified the new version of the law, which included two major changes: (1) it introduced birthright citizenship; and (2) it changed the eligibility criteria for naturalization.

This paper focuses on the first change. Until 1999, citizenship was granted according to *ius sanguinis*, i.e., children became German citizens only in cases where at least

one parent held the German citizenship. As of 1st January 2000, the prevailing regime changed to *ius soli*, granting each child born on German territory a *conditional* right to German citizenship at birth. The conditionality attached to birthright citizenship was that at least one parent had been a legal resident in Germany for eight years or more at the time of birth. Upon satisfying this condition, German citizenship was *automatically* recorded in the register of birth with no need for the parents to apply for it. There were no known cases of refusal of German citizenship at birth.

Parents of children born between 1991 and 1999 could take advantage of a transition rule: conditional on having legally resided in Germany for at least eight years, they could retrospectively apply for their children's citizenship within a transition period of one year (1st January to 31st December 2000). However, only a small fraction of eligible families made use of this transition rule. In particular, in what follows we present evidence showing that the number of eligible children born in 1999 and whose parents made use of the transition rule is only about one-seventh of the number of eligible children born in 2000 who were automatically granted citizenship. The main reason why only a small fraction of families made use of the transition has to do with a lack of diffusion of information. On the one hand, families were not directly informed about the transition rule. On the other hand, the public discussion mainly revolved around the two other aspects of the reform.

The reform also changed the path to citizenship for adults. On the one hand, it relaxed the length-of-residence requirement from 15 years down to eight. On the other hand, it tightened the requirements regarding German-language proficiency. Thus, despite the relaxed residence requirement, the effort associated with a citizenship application increased.[5] In principle, this aspect of the reform could have have induced immigrant parents to naturalize after their children became German citizens at birth. However, there is evidence that the German citizenship reform did not have the effect of increasing immigrant parents' willingness to naturalize themselves (Sajons, 2012).

3.2. The German Education System

The German education system is comprised of three parts: (1) the phase between birth and primary school, which is divided into early care available for children up to an age of 2 years and preschool available for children aged 3 to 5 years; (2) primary school, which usually starts at age 6 and continues for four years; and (3) secondary school, which typically starts age 10 and continues for between five (mandatory) and nine years.

Preschool attendance is non-mandatory in Germany. Notwithstanding this, since 1996, every child turning 3 years old has been legally entitled to a place in preschool. As a result, the supply of preschool slots rose dramatically in late 1990s and ultimately

5. Notice that this aspect of the reform applied to *all* immigrant parents, i.e., independently of whether their children were born before or after the cutoff date.

met demand the early 2000s. Preschool is heavily subsidized on an income sliding scale. In case of severe financial constraints, fees can be reimbursed by the local youth welfare service (Bundesministerium für Familie, Senioren, Frauen und Jugend, 2013). In 2012, 96% of all 3-5 year-old native children attended preschool (Federal Statistical Office, 2012), while the corresponding share of immigrant children was 87% (Bildungsberichterstattung, 2012).

Between birth and primary school, children undergo several mandatory medical screenings. These medical screenings are intended to document children's health, diagnose medical anomalies, and provide necessary treatment as early as possible. An important medical screening is the school entrance examination, which is offered by the local health service and takes place in the year prior to entering primary school (i.e., when children are around 6 years old). In addition to documenting a child's health, pediatricians determine whether a child is "ready" to follow the school curriculum. The school readiness diagnosis is an important factor in school enrollment: a negative assessment can lead to school entrance being deferred by one year. Yet, the ultimate decision when to enroll a child for primary school lies in the hand of parents.

After passing all four grades of primary school, students are referred to secondary school (around age 10). Secondary school is divided into the following three tracks:[6] the lowest track (the so-called *Hauptschule*) which continues up to Grade 9 or 10 and gives student a general education in preparation for an apprenticeship; the intermediate track (*Realschule*) which goes up to Grade 10 and can either lead to an apprenticeship or to a higher-level vocational school; and the high school track (*Gymnasium*) which goes up to Grade 12 or 13 and prepares students for university.

The transition from primary school to the different secondary school tracks is a critical stage in the German education system. In the final year of primary school, teachers make a recommendation which secondary school track their students should enter. These recommendations are supposed to reflect students' abilities and not their socioeconomic background. During our study period, the ultimate track choice was at the discretion of the parents in five German federal states, including Schleswig-Holstein. In all other states, teacher recommendations were binding.[7] In 2009, 24.1% of all 15-year-old immigrant children attended *Hauptschule*, in comparison to 13.3% of their native peers. In contrast, 25.9% of all 15-year-old immigrant students attended *Gymnasium*, whereas 37.1% of their native peers did so (Bildungsberichterstattung, 2012). In other words, the unconditional immigrant-native enrolment gap in the academic track amounted to 11.2 percentage points. Lüdemann and Schwerdt (2013) show that half of this gap remains after accounting for children's performance during

6. There are also a number of alternative school types, such as the Waldorf schools and the comprehensive school (*Gesamtschule*). Overall, around 10 % of all children of secondary school age attend alternative types of schools.

7. In these states, a child either has to pass a special exam or undergo a probationary period in case it wants to attend *Gymnasium* without a recommendation.

primary school, which might be due to discrimination by teachers or lower educational aspirations among immigrant families (or a combination thereof).

4. Empirical Approach

4.1. Identification Strategy

We estimate the causal effect of automatic birthright citizenship on a range of educational decisions of immigrant parents. Our identification strategy rests on a difference-in-differences design which exploits the cut-off date of the German citizenship reform (i.e., 1st January 2000). In particular, we first compare the educational choices of immigrant parents whose children were born shortly before or shortly after the cut-off date. To avoid differences across school cohorts, we restrict our attention to one school cohort, i.e., we compare children born six months before and after the cut-off date. A key concern with this simple difference is that the characteristics of parents and children might systematically vary on the two sides of the cut-off date. For example, there is evidence that children born in spring come from more advantaged socioeconomic backgrounds than children born in winter (Buckles and Hungerman, 2013). In order to avoid biased estimates due to such seasonal effects, we use immigrant children from earlier and later school cohorts as control groups. In particular, our control is comprised of immigrant children born in the 12-month windows centered around 1st January 1999 and 1st January 2001, respectively.[8] Notice that no policy change occurred at these control cut-off dates. Our regression model can be written in the following way:

$$Y_i = \alpha + \beta \text{Reform}_i + \gamma \text{After}_i + \delta \left(\text{Reform}_i \times \text{After}_i\right) + \theta D_i + \varepsilon_i, \tag{1}$$

where $Reform_i$ is a binary variable indicating whether child i belongs to the school cohort that was subject to the policy change (i.e., it switches on for children born between July 1999 and June 2000). $After_i$ is a binary assignment variable indicating whether child i was born in the months just after 1st January of a given year (i.e., it switches on for children born between January and June). $Reform_i \times After_i$ is the interaction between these two indicators and thus switches on children born between January and June 2000. We additionally control for a full set of month-of-birth dummies D_i, thus netting out the effects of age (in months) on the outcomes we are interested in.[9] This is important for at least two reasons. On the one hand,

8. Similar identification strategies have been used by Lalive and Zweimüller (2009), Dustmann and Schönberg (2012), Danzer and Lavy (2016), and Schönberg and Ludsteck (2014) in the context of parental leave reforms.

9. The assignment variable $After_i$ correlates perfectly with the birth months January to June. We therefore omit not just one, but two birth month dummies. Specifically, we omit January and December as they are immediately around the cutoff date. Note that we can control for the set

children belonging to one school cohort differ by up to 12 months in age, with children born in the earlier months likely to be more mature at any given point in time. On the other hand, and as mentioned above, children born in the later months are more likely to come from advantaged family backgrounds. We estimate this regression separately for outcomes at three stages of the educational process: preschool, primary school and secondary school. The causal parameter of interest is δ, whose interpretation we now discuss.

4.2. Interpretation of Estimates

The Effects of Automatic Birthright Citizenship vs. Optional Citizenship.—It is important to be clear upfront that δ does not identify the effects of a child's citizenship on immigrant parents' educational decisions. Instead, it captures the impacts of a policy switch from *optional* citizenship for immigrant children (under the "old" *ius sanguinis*) to *automatic* birthright citizenship (under the "new" *ius soli*). Children born after the policy change on 1st January 2000 were automatically granted citizenship at birth. In contrast, children already born at the time of the policy change could become German citizens retrospectively in cases where parents made use of the one-year transition rule or where at least one of the parents chose to naturalize him or herself. As already mentioned above, the former option was hampered by informational constraints, while the latter was associated with substantial costs. Thus, our empirical approach centers around the comparison of a regime in which citizenship was conferred automatically and costlessly to children born to foreign parents versus a regime in which immigrant parents had the costly option of obtaining citizenship for their children. For brevity, we will refer to δ as the causal effect of automatic birthright citizenship.

In order to estimate δ, one would ideally restrict attention to *eligible children* whose parents had the necessary years of residence ($\geq$ 8 years) when the reform came into effect. Since our main data sources do not contain information on parental residence, we are not able to restrict our estimation samples to eligible children. As a result, the regressions we run also cover children who were unaffected by the reform. Thus, our estimates of δ capture the reform's intention-to-treat (ITT) effect. This ITT effect will be a conservative estimate of the reform's average treatment effect on the treated (ATT), since it is estimated on a sample which includes post-policy children whose parents did not fulfill the residency criterion and hence did not qualify for birthright citizenship. In Figure 1, we combine official citizenship data of the Federal Office for Migration and Refugees (BAMF) with official birth statistics of the Federal Statistical Office (Destatis). Among the 91,273 children born to foreign nationals in the year

of birth months dummies because we rely on a comparison between children born in the year of policy change and children born in adjacent years in which there was no policy change. A simple regression discontinuity design would not allow us to do so, as the assignment variable would be a perfect linear combination of the included set of birth month dummies.

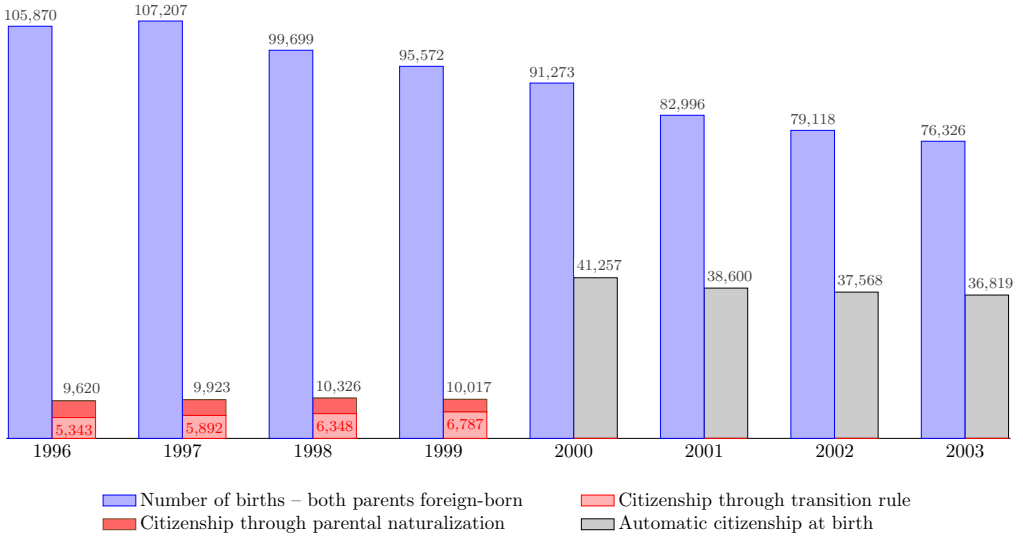

FIGURE 1
Fraction of eligible children and the reform's effect on children's citizenship

2000, 41,257 were automatically granted citizenship at birth. Thus, the fraction of eligible children in the cohort subject to the policy change was 45.2%. This suggests that the reform's ATT is in the order of roughly 2.2δ. In what follows, we present complementary evidence from the German Microcensus—Europe's largest household survey—which shows a fairly similar share of eligible children, namely 39.9%.

The Effects of Citizenship.—As an alternative to identifying the reform's impact in an ITT setting, one could ask: What is the causal effect of a child's citizenship on the education decisions of immigrant parents? Our estimates of δ would identify this effect if the birth-date cut-off perfectly determines whether a child obtains the German citizenship or not. Since this is not the case, one is left with the possibility to exploit the birth-date cut-off as a source of exogenous variation for a child's citizenship. Due to limitations of available data sources, we are not able to take that approach and implement an instrumental variable strategy. We are also not able to present two-sample instrumental variables estimates since misreporting of children's citizenship in survey data prevents us from obtaining credible first-stage results. For example, in the 2003-2004 waves of the German Microcensus, only 67% of all eligible children born in the year 2000 are reported to possess the German citizenship at the age of 3. One reason for why this share is not equal to 100% is that parents are likely to report their own nationality when asked about their child's citizenship despite the fact that their child possesses dual citizenship. That said, the evidence presented in Figure 1 gives some idea about the first-stage effect. In particular, while 45.2% of all children born in 2000 where automatically granted citizenship at birth, only 10.5% of those born in 1999 received the the German citizenship in the wake of the reform

(7.1% via the transition rule and 3.4% through parental naturalization[10]). Thus, treated children were roughly 35 percentage points more likely to hold the German citizenship as infants than non-treated ones. Put differently, this means that the share of compliers is about 35%.[11] We consider this as suggestive evidence that the local average treatment effect of a child's citizenship on immigrant parents' educational decisions is in the order of roughly 2.8δ.

4.3. Threats to Identification

Fertility Behavior.—The German citizenship reform may have induced immigrant parents to adjust their fertility behavior in three dimensions. First, parents may have delayed conception to ensure that their child is born under the new *ius soli* regime. Second, and as mentioned above, the introduction of birthright citizenship is likely to enhance children's future labor market opportunities and thus increase the perceived "quality" of children. According to the quantity-quality tradeoff emphasized by Becker and Tomes (1976), this may cause immigrant parents to adjust their desired number of children downwards. Avitabile et al. (2014) provide evidence that the German citizenship reform indeed led to a reduction in immigrant fertility, but only from 2001 onward. Hence, the children included in our sample, who were conceived before September 2000, are unlikely to be affected by this concern. In fact, a histogram of the number of immigrant children born around the cut-off date does not reveal any discontinuity (see Appendix Figure A1). In what follows, we also present evidence showing that there are no significant differences in parental background characteristics between immigrant children born shortly before and after the cut-off date. This suggests that the reform did not affect the composition parents. Notwithstanding this, we provide a robustness check in which we restrict our sample to children who were conceived before the new German naturalization law was ratified, i.e., to children conceived before July 1999 and thus born by April 2000. This leaves us with a 8-month window centered around around the cut-off date. Finally, mothers scheduled to give birth shortly before the cut-off date may try to postpone the birth date in order to benefit from *ius soli*. Although this type of behavior is difficult to implement, we perform a robustness check in which we exclude children born in the month right before and after the cut-off date (i.e., December 1999 and January 2000).

Return Migration.—A second concern is that the introduction of birthright citizenship made return migration less attractive (Sajons, 2016). As a result, the pool of

10. We have calculated the number of children obtaining the German citizenship through parental naturalization by proxying the naturalization rate of immigrant parents giving birth in year t with naturalization rate of all immigrants in year t. The annual naturalization rates of immigrants are calculated by the Federal Statistical Office and are given by: 4.04% (1996), 3.76% (1997), 3.99% (1998), and 3.28% (1999).

11. This corresponds to discontinuous jump in citizenship at the cut-off reported by Sajons (2016).

families remaining in the country may change after the introduction of birthright citizenship. Thus, if anything, the resulting selection bias leads to a lower bound of the effect as the reform might have induced less integrated families and thus more disadvantaged children to stay in Germany. Nevertheless, to test the robustness of our results to potential sample selection bias, we include a series of family background characteristics, such as single parenthood, parental education and parents' country of origin. Notice that this is only possible in two out of three datasets used in this study (see Section 5 for more details).

Miscellaneous.—To address concerns about general time trends, we flexibly control for cohort dummies as well as their interactions with birth semester as part of our robustness checks. To account for the possibility that standard errors are correlated, we run additional regressions in which standard errors are clustered at the birth month/year level.

5. Data

The questions we ask—and how we answer them empirically—require very comprehensive data. First, we need information on immigrant parents and their children throughout the first three stages of the German education system. Second, our identification strategy relies on a very small subgroup of the German population: a few cohorts of immigrant children. We therefore draw upon two unique administrative data sources from the German federal state of Schleswig-Holstein: school entrance examinations and school registers.[12] Both data sources allow us to proxy immigrant status. However, they lack the information necessary to infer whether or not immigrant children are eligible for automatic birthright citizenship. To gain insights into this issue, we use the German Microcensus as an additional data source. We now describe these three datasets in detail.

5.1. School Entrance Examination

For our analysis of the effects of birthright citizenship during the preschool phase, we draw upon administrative records from the so-called school entrance examination (SEE). This examination is mandatory for all children who turn six in the 12-month period before a new school year begins. Children born between July 1998 and June 2001 are thus included in the SEEs 2005, 2006 and 2007.[13] The SEE records contain several measures of child development (e.g., behavior problems, social skills, emotional

12. Unfortunately, administrative data on children's educational outcomes are not available for the whole German territory, but for selected states only.

13. Parents may request that their child is examined a year earlier than the official SEE. We exclude these children since they are a non-random subsample of younger age cohorts. Moreover,

stability) as well as physicians' assessments of children's school readiness at age six. Parents fill out an accompanying questionnaire about their children's previous preschool enrollment and their own background. As for the latter, the questionnaire contains information about parents' country of birth, but not about their nationality and length of residence in Germany. As a result, we are unable to restrict our sample to eligible children. In fact, all we know is whether a child's family was living in Germany at the time of the survey, but not whether the child was born in Germany. Thus, we restrict our attention to second-generation immigrant children whose parents were both not born in Germany. This sample restriction leaves us with 6,740 observations. The SEE records allow us to construct the following binary dependent variables:

- *Preschool Enrolment:* equal to one for children that have attended preschool and zero otherwise.
- *Attention Deficits:* equal to one for children diagnosed with attention deficits and zero otherwise.
- *Social Problems:* equal to one for children diagnosed with antisocial and deviant behavior (e.g., lying, fighting, stealing) and zero otherwise.
- *Emotional Problems:* equal to one for children diagnosed with emotional problems (e.g., anxiety, nervousness, lack of self confidence) and zero otherwise.
- *German Language proficiency:* equal to one for children who are fluent in German or make at most small mistakes and zero otherwise.[14]
- *School Readiness:* equal to one for children assessed to be ready for school and zero otherwise.

Table 1 displays descriptive statistics from the SEE records. In terms of the dependent variables (Panel A), a raw comparison between children born shortly before and shortly after the cut-off date suggests several differences. The preschool enrolment rate of immigrant children born after the cut-off date comes close to that of their native peers (94.2% vs. 95.4%), but it is roughly 3 percentage points lower for immigrant children already born at the cut-off (91.7%). In terms of developmental outcomes, there are no significant differences between children born shortly before and after the cut-off date, but controlling for age effects might well change this picture. The fact that children born before the cut-off have a higher probability of being assessed as "ready for school" is also likely to reflect age effects. In particular, the descriptive statistics on background variables (Panel B) show that the average age difference between the two groups of immigrant children amounts to 5.7 months. Aside from this age gap, there are no significant demographic and socioeconomic differences between immigrant children born shortly before and after the cut-off date.

each child is included only once in the SEE as children who are assessed as not being ready for school in one year are subject to a special examination one year later.

14. The German language proficiency test is only conducted with immigrant children. It was introduced in 2005 and at first only in the city of Luebeck. This means that the subsample we are able to use to analyze children's language proficiency contains only 446 observations.

Table 1
Summary Statistics: School Entrance Examination (SEE)

	Native All	Migrant All	Migrant II/99	Migrant I/00	Diff I/00 - II/99
		A. Dependent Variables			
Preschool Enrolment	0.954	0.925	0.917	0.942	0.025**
Attention Deficits	0.037	0.029	0.033	0.033	0.000
Social Problems	0.017	0.011	0.026	0.026	0.000
Emotional Problems	0.041	0.039	0.044	0.041	0.003
German Language Proficiency	-	0.597	0.606	0.619	0.013
School Readiness	0.909	0.849	0.863	0.772	-0.091***
		B. Background Variables			
Age in Months	75.176	73.805	76.396	70.724	-5.672***
Female	0.473	0.468	0.478	0.498	0.020
Siblings	0.869	1.207	1.287	1.257	-0.030
Single Parent	0.131	0.085	0.088	0.087	-0.001
Mom's Education: Low	0.200	0.217	0.220	0.235	0.014
Mom's Education: Intermediate	0.332	0.245	0.240	0.240	0.000
Mom's Education: High	0.234	0.164	0.154	0.169	0.015
Mom's Education: Missing	0.234	0.374	0.386	0.356	-0.030
Dad's Education: Low	0.236	0.235	0.236	0.222	-0.014
Dad's Education: Intermediate	0.229	0.222	0.229	0.240	0.011
Dad's Education: High	0.266	0.168	0.154	0.181	0.027
Dad's Education: Missing	0.269	0.375	0.381	0.357	-0.024
Mom's Origin: Turkey	-	0.315	0.306	0.315	0.009
Mom's Origin: East Europe	-	0.389	0.405	0.395	-0.011
Mom's Origin: Balkan	-	0.085	0.082	0.074	-0.008
Mom's Origin: EU 12	-	0.048	0.045	0.050	0.005
Mom's Origin: missing	-	0.166	0.162	0.166	0.004
Dad's Origin: Turkey	-	0.319	0.311	0.316	0.005
Dad's Origin: East Europe	-	0.377	0.393	0.376	-0.016
Dad's Origin: Balkan	-	0.087	0.081	0.077	-0.004
Dad's Origin: EU 12	-	0.047	0.042	0.051	0.009
Dad's Origin: Missing	-	0.170	0.173	0.180	0.007

Notes: *Migrant All* refers to children born between June 1998 and December 1999 (i.e., pre-reform) and whose parents were both not born in Germany. *Migrant II/99* refers to immigrant children born between July and December 1999. *Migrant I/00* refers to immigrant children born between January and June 2000. *Native All* refers to all non-immigrant children born between June 1998 and December 1999 (i.e., pre-reform).

5.2. School Registers

Our analysis of the impacts of birthright citizenship during the primary and secondary school phase is based on school register (SR) records. In Schleswig-Holstein, all primary and secondary schools are legally obliged to provide individual student records to the federal ministry of education at the beginning of each school year

(i.e. September). The three birth cohorts we study were scheduled to be admitted to secondary school in 2009, 2010 and 2011, respectively. We therefore draw upon the SR records from these three years. Since only 73.5% of all children in our sample started secondary school in the scheduled year of admission, we additionally draw upon the SR records from the subsequent years (2010, 2011, and 2012). In these three years, the birth cohorts under study were scheduled to attend the 2nd grade of secondary school and overall their 6th grade of education. This ensures that we capture the majority of children in our sample (98.5%) after they have made the transition from primary to secondary school.

The SR records provide basic information about children's gender and birthdate. In addition, they include two variables that allow us to proxy children's migrant status: country of birth and main language spoken at home. We restrict our sample to children who are born in Germany, use a language different from German as their first language at home and are not ethnic Germans ("Aussiedler"). This restriction leaves us with 2,530 observations for the SR records 2009-2012. For the three cohorts we study, there is evidence from the German National Educational Panel Study (NEPS) suggesting that our language restriction allows us to capture roughly 45% of all children with foreign-born parents.[15] This evidence also suggests that the subgroup of immigrant children speaking a language other than German at home is disproportionately made up of children from Turkish immigrants with disadvantaged backgrounds.[16] In what follows, we use the German Microcensus to examine whether the effects we uncover are specific to this subgroup of immigrant children. Finally, notice that, just as with the data from the SEE records, we are unable to restrict the SR sample to eligible children.

The SR records allows us to construct the following dependent variables for the *primary school* phase:

- *Age at School Entry:* continuous variable measuring the age of children in months at the time of primary school entry.
- *Early School Entry:* equal to one for children who have entered primary school prior to the scheduled year of admission and zero otherwise.
- *Grade Retention:* equal to one for children who have repeated a grade during primary school and zero otherwise.

As for *secondary school* education, we are able to draw upon the following dependent variables:

15. The NEPS data also indicate that only a negligible fraction of children whose parents were both born in Germany speak a language other than German at home.

16. According to the NEPS, roughly 30% of all immigrant children are of Turkish origin, whereas among those speaking a foreign language at home this share amount to 52%. Similarly, immigrant children speaking a foreign language at home are twice as likely to have a father in the lowest education category (i.e., *Hauptschule*) than the average immigrant child.

Table 2
Summary Statistics: School Registers (SR)

	Native All	Migrant All	Migrant II/99	Migrant I/00	Diff I/00 - II/99
	A. Dependent Variables: Primary School				
Age at School Entry	79.843	80.491	76.906	83.974	7.068***
Early School Entry	0.082	0.052	0.086	0.019	-0.067
Grade Retention	0.156	0.271	0.236	0.305	0.069**
	B. Dependent Variables: Secondary School				
Recommendation for Gymnasium	0.391	0.131	0.154	0.105	-0.048**
Gymnasium	0.373	0.163	0.194	0.132	-0.062**
– with Recommendation	0.293	0.087	0.108	0.067	-0.041**
– w/o Recommendation	0.070	0.075	0.086	0.065	-0.021
	C. Background Variables				
Age in Months	126.400	126.506	123.410	129.573	6.163***
Female	0.490	0.494	0.506	0.482	-0.024

Notes: *Migrant All* refers to children born in Germany between June 1998 and December 1999 (i.e., pre-reform) and use a language different from German as their main language at home. *Migrant II/99* refers to immigrant children born between July and December 1999. *Migrant I/00* refers to children born between January and June 2000. *Native All* refers to all non-immigrant children who were born in Germany between June 1998 and December 1999 (i.e., pre-reform).

- *Recommendation for High Gymnasium:* equal to one for children who have received the official recommendation to attend the academic track of secondary school and zero otherwise.
- *Gymnasium with Recommendation:* equal to one for children who have entered the academic track of secondary school based on the recommendation from their primary school teachers.
- *Gymnasium w/o Recommendation:* equal to one for children who have entered the academic track of secondary school against the recommendation from their primary school teachers.

Table 2 presents descriptive statistic from the SR records. Compared to their native peers, immigrant children are less likely to enter primary school ahead of the scheduled year of admission (5.2% vs. 8.2%), have a higher probability of grade retention (27.1% vs. 15.6%) and are less likely to receive a recommendation for the academic track of secondary school (13.1% vs. 39.1%). The actual immigrant-native enrolment gap in the academic track of secondary school amounts to 21 percentage points. In official statistics, this gap comes to approximately 11 percentage points. This suggests that our SR sample is disproportionately made up of children from disadvantaged backgrounds, an issue already discussed above. A comparison between immigrant children born shortly before and shortly after the cut-off date suggests

several differences which are likely to be driven to a large extent by age effects. In particular, children born before the cut-off start school at an earlier age (77 vs. 84 months) and are less likely to repeat a grade during primary school (23.6% vs. 30.5%). In addition, they are more likely to receive a recommendation for the academic track of secondary (15.4% vs. 10.5%), which is also reflected in a higher attendance rate (19.4% vs. 13.2%). This underlines the importance of using a difference-in-differences approach which nets out the effects of age.

Unfortunately, the SR records do not provide information on parental background. Thus, we are unable to test whether children born shortly before and after the cut-off date balance in their background characteristics.

5.3. German Microcensus

The German Microcensus (GMC) is the largest European household survey, interviewing 1% of all German households. We use this data source for two purposes. First, the GMC contains the information necessary to construct children's eligibility status (i.e., parents' year of arrival in Germany), allowing us to double check the evidence in Figure 1. To this end, we use the GMC waves 2009-2012 and first restrict the sample to all children born in Germany whose parents are both foreign-born.[17] The resulting sample of *all* immigrant children contains 2,532 observations. In a second step, we further restrict this sample to *eligible* children whose parents (i.e., at least one of them) had the necessary years of residence (≥ 8) when the reform came into effect. This leaves us with 1,011 observations, suggesting that the fraction of eligible children in the cohort subject to the policy change was 39.9%. Second, we use the GMC waves 2009-2012 to investigate the robustness of results obtained from our SR sample, which is disproportionately made up of immigrant children from disadvantaged backgrounds. Due to small sample sizes, we are unable to restrict the GMC samples to children residing in Schleswig-Holstein, i.e., we include children from the whole federal territory of Germany.[18]

The GMC data allows us to examine whether immigrant children eligible for birthright citizenship are a special subgroup of all immigrant children. Overall there are no striking differences between the two samples, with one notable exception: parents' countries of origin (see Appendix Table A1). This is not surprising as the main difference between eligible and non-eligible immigrant children is parents' year of arrival in Germany. Roughly one-fourth of children in both samples are of Turkish origin. Among eligible children, disproportionately few stem from Eastern European

17. The GMC interviews household throughout the year. To capture whole school cohorts, we draw upon information from interviews conducted between the fourth quarter in 2009 and the second quarter in 2012.

18. We exclude the federal states of Berlin and Brandenburg as tracking into secondary school in these states takes place in grade 7 instead of grade 5.

families,[19] while immigrant parents from the Balkan and the EU are over-represented. There is also a sizeable amount of eligible children for which the information on the mother's country of origin is missing.

6. Results

6.1. Preschool

Table 3 presents our results for the effects of automatic birthright citizenship at the preschool level. Column (1) only controls for the full set of month-of-birth dummies, while Columns (2) to (3) sequentially condition on child and family background characteristics. The estimates throughout Panel A show that the policy had a significant effect on the preschool enrolment decisions of immigrant parents. Our preferred specification in Column (3) shows that the introduction of automatic birthright citizenship led to an 3.1 percentage points increase in the preschool enrolment rate of immigrant children. Thus, the share of immigrant children not enrolled in preschool (8.3% among those born shortly before the cut-off date) decreased by 37%. Interestingly, this effect appears to have closed the preschool enrolment gap between native children—with an enrolment rate of 95.4%—and their immigrant peers completely.

It is well understood that preschool participation can have positive effects on children's cognitive, language, and social development, particularly among children at risk for poor outcomes. In Panel B, we therefore examine the impact of birthright citizenship across four developmental outcomes. The results suggest positive and significant effects on immigrant children's emotional-behavioral development. In particular, we observe a reduction in the incidence of attention deficits among immigrant children by 1.8 percentage points or 54% of the pre-reform mean. In a similar vein, the reform led to a reduction in the extent of emotional problems by 2.1 percentage points or 48%. In contrast, the prevalence of social problems among immigrant children was unaffected by the introduction of birthright citizenship. The final question we address here is whether the policy had an effect on the German language proficiency of immigrant children. Our preferred specification in Column (3) shows that the share of immigrant children proficient in German increased by 6.7 percentage points or 11%, but the estimate is not significant at any conventional level. Notice, however, that the lack of significance is likely to be related to the small sample size. Indeed, recall that the language proficiency test was conducted with only 446 immigrant children from a single city in Schleswig-Holstein (Luebeck), while all other developmental outcomes are available for immigrant children from the whole territory of this federal state (with N between 5,168 and 6,464). A power calculation

19. This might be due to the fact that many migrants from Eastern Europe are ethnic Germans.

Table 3
The Effects of Automatic Birthright Citizenship at the Preschool Level

	(1)	(2)	(3)
	A. Parental Decision-Making		
Preschool Enrolment	0.032**	0.032**	0.031**
[0.917]	(0.013)	(0.013)	(0.013)
N	6,740	6,740	6,740
	B. Developmental Outcomes		
Attention Deficits	-0.019**	-0.018**	-0.018**
[0.033]	(0.009)	(0.009)	(0.009)
N	6,260	6,260	6,260
Social Problems	0.000	-0.001	0.000
[0.026]	(0.008)	(0.008)	(0.008)
N	5,169	5,169	5,169
Emotional Problems	-0.021**	-0.022**	-0.021**
[0.044]	(0.010)	(0.010)	(0.010)
N	6,464	6,464	6,464
German Language Proficiency	0.019	0.015	0.067
[0.606]	(0.098)	(0.098)	(0.100)
N	446	446	446
	C. School Readiness Recommendation		
School Readiness	0.009	0.009	0.009
[0.863]	(0.019)	(0.019)	(0.019)
N	6,740	6,740	6,740
Birth Months	Yes	Yes	Yes
Child Characteristics		Yes	Yes
Family Characteristics			Yes

Notes: OLS estimates of equation (1) using the school entrance examination (SEE) records 2005-2007. Mean of dependent variable for children born between July and December 1999 reported in square brackets. Child characteristics include gender and age at the SEE. Family characteristics include number of siblings, a dummy for single-parent household, parents' educational degree and parents' country of origin. * 10 percent, ** 5 percent, *** 1 percent confidence level.

suggests that the language proficiency effect would be significant at the 5% level with a sample size of $N = 5,500$.

As part of the school entrance examination, pediatricians provide an overall assessment of children's school readiness and may recommend deferred school entry. The results in Panel C indicate that the reform had no effect on pediatricians' recommendations regarding immigrant children's school readiness. This seems puzzling at first, given the sizeable positive effects discussed above. One explanation

Table 4
The Effects of Automatic Birthright Citizenship at the Primary School Level

	(1)	(2)
	A. Parental Decision-Making	
Age at School Entry	0.658*	0.666*
[76.906]	(0.347)	(0.347)
N	2,498	2,498
Early School Entry	0.050**	0.051**
[0.086]	(0.023)	(0.023)
N	2,530	2,530
	B. Educational Outcomes	
Grade Retention	-0.049	-0.051
[0.236]	(0.037)	(0.037)
N	2,482	2,482
Birth Months	Yes	Yes
Child Characteristics		Yes

Notes: OLS estimates of equation (1) using the school register (SR) records 2009-2012. The estimation samples are restricted to immigrant children born in Germany and who use a language different from German as their main language at home. Mean of dependent variable for children born between July and December 1999 reported in square brackets. Child characteristics include gender. Family characteristics not available for the SR records. * 10 percent, ** 5 percent, *** 1 percent confidence level.

for the lack of an effect might be that the positive findings for preschool enrolment and children's development were not driven by marginal children at risk of being identified as not ready for school. An alternative explanation might be that the rules governing the school readiness recommendation give rise to institutional discrimination against immigrant children, the incidence of which might have been unaffected by the reform. That said, and as mentioned earlier, the ultimate decision when to enrol a child for preschool lies in the hands of parents, to which we now turn.

6.2. Primary School

Table 4 documents the effects of automatic birthright citizenship at the primary school level. Recall that our analysis here is based on estimation samples which are restricted to immigrant children who use a language different from German as their main language at home.

Before turning to our results, note that, prior to the reform, native children started school at a younger age (79.8 months on average) than their immigrant peers (80.5 months on average). The key message that now emerges from the first row in Panel A is that the introduction of automatic birthright citizenship caused immigrant parents

to enrol their children earlier in primary school: the average school starting age of immigrant children decreased by 0.7 months, an effect which closes the difference in school starting age between immigrant children and their native counterparts. The second row in Panel A shows that the policy increased the incidence of early school entry among immigrant children by 5.1 percentage points or 59% of the pre-reform mean.

The timing of primary school entry may have an effect on children's educational outcomes, although the direction of this effect is *a priori* unclear. For example, starting school younger may be an advantage if children learn more in school than at home or preschool environments, and a disadvantage if the opposite is true. For immigrant children, with relatively high rates of social and economic disadvantages among their families, an earlier integration into the school system might be expected to be beneficial. It might also be that parents get more involved in their children's education if they are young for their grade level. Starting school younger may, however, be a disadvantage if children cannot learn as well in school earlier in their development life. Due to data limitations, we are not able provide a comprehensive analysis of children's educational outcomes during primary school. However, the data allow us to examine the effects of the reform on the probability of grade retention. Panel B shows a sizeable reduction post-policy in the probability of grade repetition among immigrant children. The point estimate from our preferred specification is -5.1 percentage points which corresponds to a 22% reduction. Note, however, that this effect is statistically not different from zero at conventional levels.

6.3. Secondary School

In Table 5, we focus on the effects of automatic birthright citizenship at the secondary school level. After four years of primary school, the German education system separates children into three educational tracks that differ in academic orientation: secondary general school, intermediate school, and high school. Before children are tracked into these differing-ability schools, primary school teachers make a recommendation which secondary school track a child should attend. The results in Panel A show that the likelihood of immigrant children receiving a recommendation for the academic track of secondary school was unaffected by the reform. This finding is somewhat unexpected given the positive effects we have uncovered at the preschool and primary school level. However, there is evidence that parental background, even conditional on student achievement, is a key explanatory factor for teachers' track recommendations (Lüdemann and Schwerdt, 2013), and this link is unlikely to have been affected by the policy.

During our study period, Schleswig-Holstein was one of five federal states in Germany where parents were not obliged to follow the track recommendations of primary school teachers. Thus, the ultimate decision which track a child would follow in secondary school was at the discretion of parents. Panel B sheds light on the decision-making process of immigrant parents. On the one hand, the proportion of

Table 5
The Effects of Automatic Birthright Citizenship at the Secondary School Level

	(1)	(2)
	A. Track Recommendation	
Recommendation for	0.001	0.001
Gymnasium [0.154]	(0.032)	(0.032)
N	1,959	1,959
	B. Parental Decision-Making	
Gymnasium with	0.011	0.012
Recommendation [0.108]	(0.024)	(0.024)
N	2,530	2,530
Gymnasium w/o	0.039*	0.040*
Recommendation [0.086]	(0.024)	(0.024)
N	2,530	2,530
Birth Months	Yes	Yes
Child Characteristics		Yes

Notes: OLS estimates of equation (1) using the school register (SR) records 2009-2012. Mean of dependent variable for children born between July and December 1999 reported in square brackets. Child characteristics include gender. Family characteristics not available for the SR records. * 10 percent, ** 5 percent, *** 1 percent confidence level.

immigrant children attending the high school track of secondary school *with* an official recommendation was unaffected by the policy. This finding is as expected given that we found no effect on the teachers' recommendations. On the other hand, the share of immigrant children attending the academic track *without* an official recommendation rose by 4 percentage points or 47% of the pre-reform mean. This suggests that the policy induced parents to override the recommendations of teachers to enable their children access to the academic track of secondary school. Using the summary statistics in Table 2, it can be seen that the estimated effect reduces the academic-track enrolment gap between native and immigrant children by 19%.

Our results so far are based on SR samples which are restricted to immigrant children who use a language different from German at home. Table 6 presents results from the GMC. To reiterate, the GMC has two advantages over the SR records. First, we do not need to proxy immigrant status by language spoken at home; this allows us to provide estimates for all immigrant children whose parents are foreign-born. Second, the GMC contains the information necessary to construct children's eligibility status as well as parental background characteristics. Notice, however, that our GMC samples cover children from the whole federal territory of Germany, not just Schleswig-Holstein. Moreover, the GMC provides no information on teachers' track recommendations. The first row in Table 6 presents estimation results for all immigrant children, i.e., eligible and non-eligible ones. Although not significant, the

Table 6
Evidence from the German Microcensus

	(1)	(2)	(3)
All Children: Gymnasium	0.030	0.030	0.054
[0.253]	(0.036)	(0.036)	(0.037)
N	2,532	2,532	2,532
Eligible Children: Gymnasium	0.053	0.053	0.060
[0.207]	(0.056)	(0.056)	(0.053)
N	1,011	1,011	1,011
Birth Months	Yes	Yes	Yes
Child Characteristics		Yes	Yes
Family Characteristics			Yes

Notes: OLS estimates of equation (1) using the GMC waves 2009-2012. Mean of dependent variable for children born between July and December 1999 reported in square brackets. Child characteristics include gender. Family characteristics include number of siblings, a dummy for single-parent household, parents' educational degree and parents' country of origin and length of stay. * 10 percent, ** 5 percent, *** 1 percent confidence level.

point estimates are in line with our main finding in Table 5 (second row of Panel B): depending on the specification, the proportion of immigrant children tracked into high school rose by 3 to 3.8 percentage points post-policy.[20] In the second row of Table 6, we see that these point estimates increase by once we restrict the sample to eligible children. This is consistent with our discussion in Section 4.2 that our ITT analysis provides conservative estimates of the reform's average treatment effect of the treated.

6.4. Robustness

In this section, we subject our results to robustness checks by repeating the analysis for the alternative specifications discussed in Section 4.3: (i) we cluster standard errors at the birth month/year level; (ii) we implement the so-called donut strategy by dropping the months just around the cut-off date (i.e., December and January); (iii) we restrict our samples to children born before the ratification of the citizenship reform by narrowing the window around the cut-off date (from 12 to 8 and 6 months, respectively); (iv) we control flexibly for possible time trends by interacting being born between January and June with each birth cohort.

20. The GMC does not allow us to investigate whether this effect is driven by immigrants parents overriding the official recommendation of primary school teachers.

Table 7
Robustness

	(1) Cluster	(2) Donut	(3) 8-month window	(4) 6-month window	(5) Trend
			A. Preschool		
Preschool enrolment	0.032**	0.041***	0.037**	0.017	0.036***
	(0.014)	(0.014)	(0.015)	(0.018)	(0.013)
Mean	[0.917]	[0.918]	[0.914]	[0.924]	[0.917]
N	6,740	5,523	4,580	3,441	6,740
			B. Primary School		
Age at School Entry	-0.658*	-0.934**	-0.414	0.050	-0.643*
	(0.359)	(0.392)	(0.391)	(0.425)	(0.347)
Mean	[76.906]	[77.399]	[76.140]	[75.679]	[76.906]
N	2,498	2,070	1,634	1,213	2,498
Early School Entry	0.050**	0.072***	0.027	0.009	0.100***
	(0.023)	(0.026)	(0.025)	(0.028)	(0.027)
Mean	[0.086]	[0.085]	[0.064]	[0.061]	[0.086]
N	2,530	2,096	1,648	1,226	2,530
			C. Secondary School		
Gymnasium with	0.011	0.033	0.013	-0.041	0.011
Recommendation	(0.022)	(0.026)	(0.030)	(0.034)	(0.024)
Mean	[0.108]	[0.102]	[0.125]	[0.127]	[0.108]
N	2530	2096	1648	1226	2530
Gymnasium w/o	0.039*	0.039*	0.024	0.096***	0.046*
Recommendation	(0.024)	(0.024)	(0.027)	(0.035)	(0.030)
Mean	[0.086]	[0.088]	[0.075]	[0.061]	[0.086]
N	2530	2096	1648	1226	2530

Notes: OLS estimates of equation (1) using the school register (SR) records 2009-2012. Mean of dependent variable for children born between July and December 1999 reported in square brackets. Child characteristics include gender. Family characteristics not available for the SR records. * 10 percent, ** 5 percent, *** 1 percent confidence level.

Table 7 presents the results. The following points are worth noting. First, specification (1) shows that our results are invariant to clustering standard errors at the birth month/year level, suggesting that our estimates are not spuriously driven by patterns of serial correlation. Second, the fact that our results are robust to specifications (2)-(4) indicates that patterns of selective timing of fertility are unlikely to be a concern in our setting. Note, however, that our estimates for *Age at School Entry* and *Early School Entry* turn insignificant once restrict our attention to children born in 8-month and 6-month windows centered around the reform's cut-off date. This is not an unexpected result: these specifications drop children born between July and

August, i.e., the oldest children in a given school cohort; it is exactly those children who are most likely to start school ahead of the scheduled year of admission. Third, controlling flexibly for possible time trends yields, if anything, stronger results: the introduction of birthright citizenship led to an increase in preschool enrolment by 3.6 percentage points, an increase in the probability of starting primary school one year earlier than scheduled by 10 percentage points, and an increase in the probability of attending the academic track of secondary school without a recommendation by 4.6 percentage points.

7. Concluding Comments

Successfully integrating children with migrational backgrounds into the education system is high on the policy agenda in many countries. Yet, surprisingly little is known about causal factors underlying immigrant children's educational integration. In this paper, we have taken some steps to fill this void by evaluating whether a major citizenship reform in Germany—one that saw the introduction of automatic birthright citizenship—caused immigrant parents to adjust their educational choices for their children. Theoretically, a link might be expected because granting citizenship at birth can be viewed as a positive shock to the long-run rate of return on parental investments in children's human capital. Empirically, we exploit a birth date cut-off determining whether a child became eligible for birthright citizenship or not. This allows us to overcome problems of endogeneity using a difference-in-differences approach: our treatment group comprises children born shortly before and shortly after the reform's cut-off date, while children from adjacent birth cohorts are used as the control group. Our results show that the introduction of automatic birthright citizenship had sizeable positive effects on the educational integration of immigrant children at the first three critical stages of the German education system. In particular, the policy caused immigrant parents to (i) send their children to preschool more often; (ii) enrol their children earlier in primary school; and (iii) adjust their secondary school track choice in a way that enables their children better access to higher education.

Our study offers some lessons for policy-makers and raises interesting questions for future research. Granting citizenship rights to immigrant children in places where they are poorly integrated into the education system might be an effective policy lever for reducing educational disparities. Indeed, when taken at face value, our results suggest that automatic birthright citizenship incentivizes immigrant parents to make educational choices that are closer to those of their native-born counterparts than would be the case without this policy. While our analysis provides a range of insights, much remains to be done to understand the longer-term effects of birthright citizenship. The cohorts born around the German citizenship reform will soon enter the labor market, form their own families and participate in civic life. Understanding

the effects of birthright citizenship in these domains presents an important and rich agenda for future research.

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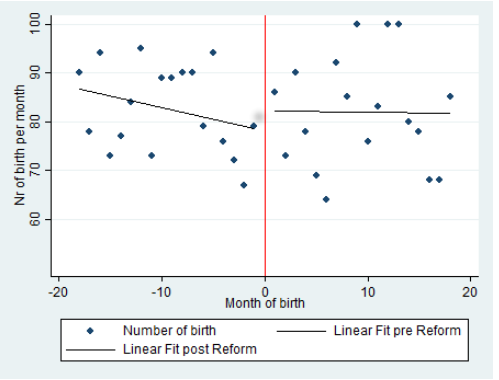
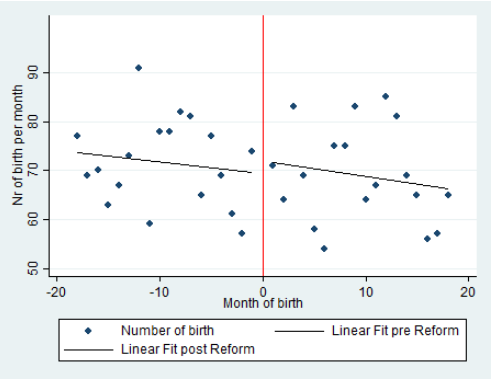
130–151.

Appendix: For Online Publication



(A) *All immigrant children*



(B) *Eligible immigrant children*

FIGURE A1
Number of births by month of birth (Source: German Microcensus 2009-2012).

Table A1

Summary Statistics: Full v/s Eligible Sample – German Microcensus

	Native	Migrant All	Migrant All II/99	Migrant All I/00	Diff All I/00-II/99	Migrant Eligible II/99	Migrant Eligible I/00	Diff Eligible I/00-II/99
				A. Dependent Variables				
Gymnasium	0.341	0.232	0.253	0.213	-0.040**	0.201	0.207	0.005
				C. Background Variables				
Age	42.350	42.338	43.077	40.980	-2.097***	43.194	41.04	-2.154
Female	0.484	0.477	0.456	0.494	0.038*	0.453	0.487	0.033
Siblings	1.098	1.459	1.437	1.406	-0.031	1.475	1.353	-0.121***
Single parent	0.229	0.175	0.168	0.153	-0.015	0.137	0.16	0.023
Mom's education:								
low	0.226	0.341	0.325	0.351	0.026	0.353	0.347	-0.006
intermediate	0.370	0.251	0.280	0.291	0.011	0.245	0.153	-0.091**
high	0.215	0.131	0.141	0.083	-0.059	0.108	0.107	-0.001
Dad's education:								
low	0.241	0.351	0.360	0.361	0.001	.388	.4	.012
intermediate	0.182	0.173	0.176	0.228	0.052**	.137	.127	-0.01
high	0.202	0.120	0.125	0.093	-0.033	0.122	0.093	-0.029
Mom's origin:								
Turkey	/	0.131	0.139	0.138	0.001	0.223	.227	.004
Eastern Europe	/	0.108	0.104	0.095	-0.008	0.079	.073	-.006
Balkan	/	0.072	0.131	0.095	0.036	.165	.153	-.012
EU (after 2000)	/	0.113	0.099	0.095	0.004	.101	.107	.006
other country	/	0.452	0.443	0.464	-0.021	.396	.353	-.042
Dad's origin:								
Turkey	/	0.122	0.131	0.0125	0.006	.216	.213	-.002
Eastern Europe	/	0.095	0.072	0.095	-0.023	0.05	.033	-.017
Balkan	/	0.082	0.109	0.085	0.024*	.137	.133	-.003
EU (after 2000)	/	0.072	0.064	0.055	0.009	.115	.107	-.008
other country	/	0.387	0.397	0.409	-0.012	.353	.313	-.039

Notes: *Migrant All* refers to children born in Germany between June 1998 and December 1999 (i.e., pre-reform) and whose parents were both not born in Germany. *Migrant All* refers to children born in Germany between June 1998 and December 1999 (i.e., pre-reform) and whose parents were both not born in Germany but fulfilled the residency criterion at the child's birth. *Migrant II/99* refers to immigrant children born between July and December 1999. *Migrant I/00* refers to children born between January and June 2000. *Native All* refers to all non-migrant children born in Germany between June 1998 and December 1999 (i.e., pre-reform).