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Birth registration and the impact on educational attainment

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Abstract*

The drivers of educational attainment have been the subject of much research both in the developed and the developing world. Yet, nothing is known about the effect of birth registration on schooling outcomes. Birth registration is not only a fundamental human right but also a requirement to obtain additional documents of legal identity and access many government benefits. Using data for the Dominican Republic, this paper is the first to shed light on the causal impact of the lack of birth registration on education. Controlling for potential endogeneity and standard socioeconomic determinants of education, this paper finds that children without documents of birth registration do not face lower chances of entering the schooling system. Yet, the absence of birth registration becomes a critical obstacle to graduate from primary school and translates into fewer years of overall educational attainment.

JEL codes: O12, R12, R20

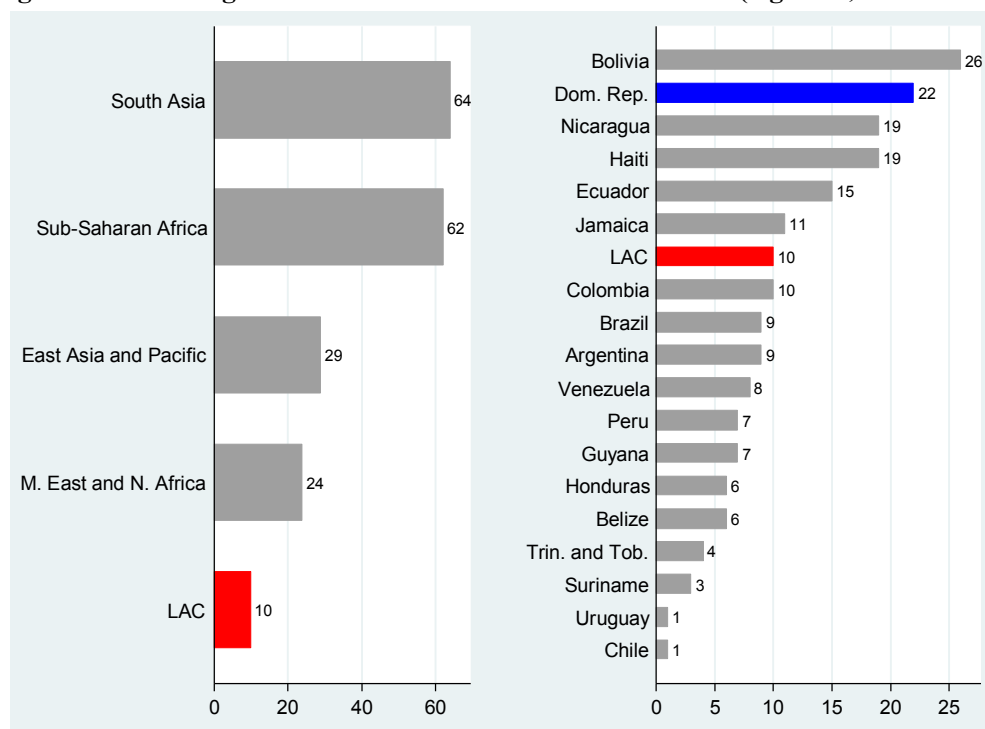
Keywords: Schooling; Under-registration

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Introduction

According to UNICEF (2010), 10 percent of children under the age of 5 do not have a birth certificate in Latin America and the Caribbean (LAC). This compares favorably to other regions of the world, such as Sub-Saharan Africa and South Asia, where over 60 percent of children this age do not have a birth certificate (Figure 1). However, there is considerable heterogeneity across countries in the LAC region. Unregistered births range from over 20 percent in Bolivia and the Dominican Republic, to under 7 percent in Chile, Peru, and Trinidad and Tobago.

Figure 1. Percentage of Children without Birth Certificates (Age 0–4, 2000–2009*)

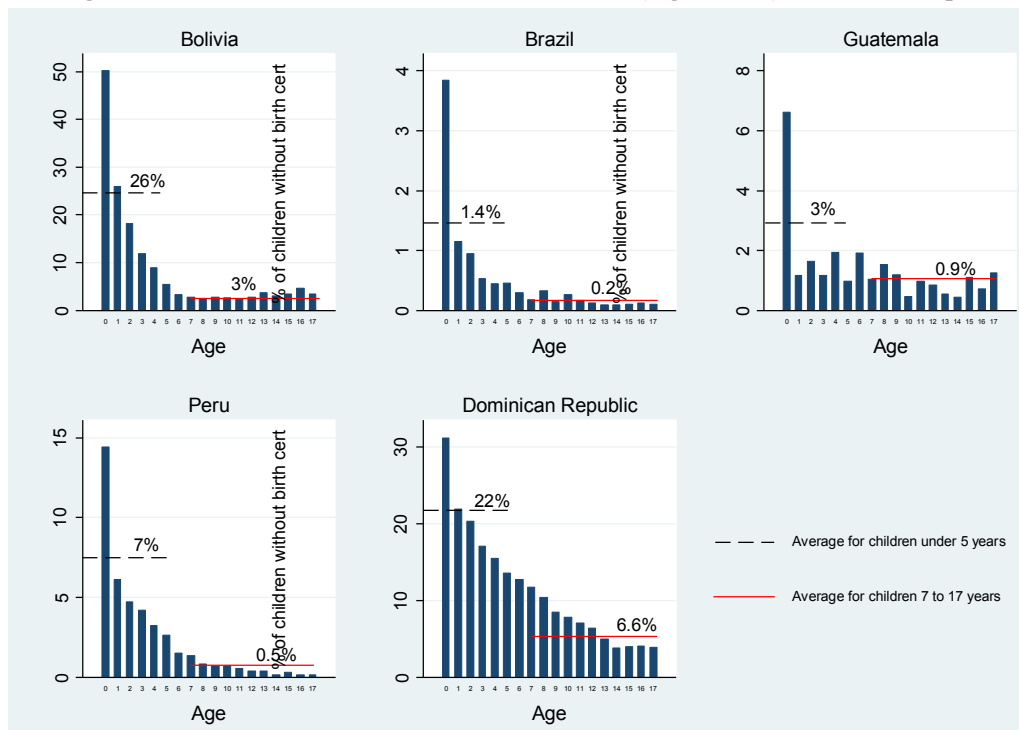


Notes: UNICEF global databases 2010, from Multiple Indicator Cluster Surveys (MICS), Demographic and Health Surveys (DHS) and other national surveys. *Refers to most recent year available.

Children without birth certificates are at risk of lifelong exclusion from fundamental benefits and rights, including access to education, health services, conditional cash transfers, and pensions. Moreover, they may be denied civil rights such as adoption and inheritance and be exposed to great jeopardy from exploitation and human trafficking. Notwithstanding these terrible potential consequences, the links between lack of birth registration and benefits, rights, and vulnerabilities have not been rigorously studied.

This paper looks at the impact of birth under registration on educational attainment in the Dominican Republic. The Dominican Republic is the country with the highest percentage (7 percent) of children of school age without birth certificates in the LAC region (Figure 2). In addition, UNESCO (2009) reports that the Dominican Republic has one of the lowest net schooling enrollment rates in the region.¹

Figure 2. Children without a Birth Certificate (Ages 0–17), national samples



Source: Bolivia DHS 2008, Brazil PNAD 2009, Guatemala ENCOVI 2000, Peru DHS 2004–2008, and the Dominican Republic DHS 2007.

Political constitutions in LAC grant the right to education without explicit mention of the need to prove the alleged name or nationality. The Dominican Republic is not the exception. The law of education of 1997 guarantees the right to education to all legal residents of the Dominican Republic.² But given that children without birth certificates have no proof of legal residency schools were not able to admit them. In 2006, a decree by the Ministry of Education ended this requirement, and schools began accepting students without birth certificates.³ This was only a

¹ Net enrollment rate is defined as the number of children of official primary school age who are enrolled in primary education as a percentage of the total children of the official school age population.

² See Law 66-97: General Law of Education 1997.

³ There is qualitative evidence that some schools were already accepting children without birth certificates before this decree was implemented. See Tamargo (2008).

palliative measure because to obtain the certificate of completion of eighth grade (primary school diploma) and pass national tests, a formal proof of name is still needed.

We take these facts into consideration to analyze the effect of lack of birth certificates on school entrance, enrollment, primary school completion, and total years of education for children aged 7–18. Our analysis reveals that children without a birth certificate have considerably lower chances of completing primary education and attain fewer grades. The results are robust to different model specifications, allowing us to infer a causal and significant negative effect of lack of birth registration on education.

Literature

Qualitative studies in the LAC region have shown that children without documents of identification have more difficulty accessing public services. Bracamonte and Ordonez (2006) analyze the consequences of lack of a birth certificate in Chile, Colombia, Honduras, Ecuador, Nicaragua, and Peru on access to education, health services, and conditional cash transfers. Harbitz and Tamargo (2009) offer a qualitative exploration of the factors that contribute to under-registration of births and lack of legal identity. Harbitz and Boekle-Giuffrida (2009) document the diverse challenges faced by those lacking legal identification documents. To date, the only two quantitative studies that look at the relationship between birth certificates and schooling are Castro and Rud (2011) and Arcos et al. (forthcoming). These studies find a negative correlation between the lack of a birth certificate and schooling in the Dominican Republic and Peru, but they cannot offer a causal interpretation. The latter study also finds a negative relationship between birth certificates and immunization among children under the age of 5.

On the determinants of birth under-registration, Duryea, Olgiati, and Stone (2006) conclude that mothers are more likely to register a child's birth if they received prenatal care and delivered the baby at a health facility, but less likely if they are teenagers. Two of the most cited reasons for why the children are not registered are costs and distance to registry offices (UNICEF, 2005; Bracamonte and Ordonez, 2006; Harbitz and Tamargo, 2009; Harbitz and Boekle-Giuffrida, 2009). After controlling for socioeconomic and household characteristics, Corbacho and Osorio (2012) find that distance to the nearest civil registry office is an important impediment to birth registration in Bolivia and the Dominican Republic.

Data and Summary Statistics

The main source of data is the 2007 Demographic and Health Survey (DHS) of the Dominican Republic. The DHS are nationally representative household surveys conducted in more than 70 developing countries using a standard methodology. They include extensive information on health and education outcomes, as well as household socioeconomic characteristics. They are among the few surveys with information on documents of identification.⁴ The DHS of the Dominican Republic is unique in that it also contains data on the geographic location (data collected with global positioning system [GPS] devices) of clusters of households. Following Corbacho and Osorio (2012), we paired this information with the GPS data for all 159 civil registry offices in the Dominican Republic and calculated the linear distance between each cluster of households and the nearest civil registry office. As explained in detail below, distance to the civil registry office is one of the instrumental variables in the econometric model. A second instrumental variable is the legal identity document of the mother. However, due to the possibility that these instrumental variables are correlated with unobservable factors (such as labor markets and infrastructure), we restrict the sample for econometric analysis to urban areas and perform econometric tests to assess their validity.

The main variables of interest are education outcomes. We look at entrance and enrollment rates at different stages of the education system, as well as overall grades attained. The Dominican education system for individuals under age 18 has three segments (see Figure 3): optional pre-school (ages 6 and under), compulsory primary education (ages 7–14), and optional high school (ages 15–18). Primary education is organized into two cycles of 4 grades each. Our study does not look at post-high school education because there are no data on birth registration for individuals older than 18.

⁴ The DHS were not designed to study legal identity issues. Fortunately for the Dominican Republic, the 2006 ENHOGAR household survey asked about birth certificates. This provided us a secondary and independent source of data to cross check the accuracy of birth registration rates in the DHS. We were able to confirm that birth registration rates in both datasets coincide, being 22 percent for children under the age of 5, providing us confidence in our use of the DHS.

Figure 3. Structure of the Education System in the Dominican Republic

	Age	
↑	19+	Technical schools, University (Optional) “Educación superior”
↑	18	High School (Optional) “Educación Media”
	17	
	16	
↓	15	
↑	14	Primary Schools (Compulsory) “Educación básica” 2 nd cycle
	13	
	12	
	11	
	10	Primary Schools (Compulsory) “Educación básica” 1 st cycle
	9	
	8	
↓	7	
↑	6	Optional Pre-school (Optional) “Educación inicial, opcional”
	5	
	4	
	3	
	2	
	1	
↓	0	

Source: Author's elaboration based on General Law of Education 66-97 (see <http://www.see.gob.do/Transparencia/Pages/Marco-Legal.aspx>).

The survey includes complete data for children still living in the household, and hence our sample misses those children who left home by the age of 18. Fortunately, the survey asks questions about the number of children living at home versus elsewhere. This reveals that 18 percent of the children aged 7–18 are living elsewhere, which is a significant percentage. Figure A1 in the appendix shows that the percentage of children outside the household increases with age, from about 13 percent for children aged 7–10 to 37 percent by age 18. Table A1 compares socioeconomic characteristics of the children living in and outside of the household. The table confirms that children who have left the household are on average older, are predominantly males whose mothers have less education, and are from poorer households. These statistics suggest the sample used in the analysis—children living at home—will be more representative for younger rather than older cohorts. The results for older cohorts may disproportionally include children from better off households that have characteristics that favor education and birth registration.

In Table 1, summary statistics show that 98 percent of individuals aged 7–18 entered the education system at some point in their lives. Hence, lack of birth registration is probably not an

impediment to entering school. However, net enrollment rates in either primary or secondary school are lower at 92 percent. And even lower are the rates of completion of the compulsory first and second cycles of primary school. By age 11 or above, Dominicans ought to have finished the first cycle of primary school; however, only 79 percent have done so. The percentage of teenagers finishing the second cycle of primary school and advancing to high school is only 53 percent. Lack of a birth certificate may be an explanatory factor in these later stages of educational attainment.

Table 1. Summary Statistics for Dominican Republic (2007) (Ages 7–18), urban areas

	(1) N	(2) mean	(3) sd	(4) min	(5) max
<i>Dependent variables:</i>					
Entered education system	8,153	0.978	0.147	0	1
Is enrolled in school	8,094	0.915	0.279	0	1
Completed first cycle of primary school (aged 11–18)	5,392	0.789	0.408	0	1
Completed second cycle of primary school (aged 15–18)	2,576	0.529	0.499	0	1
Grades passed	8,111	5.136	3.215	0	13
<i>Instrumental variables:</i>					
Distance to nearest registry in km	8,153	0.125	0.124	0.03	0.96
Mother without document of identification	8,153	0.017	0.129	0	1
<i>Controls:</i>					
Child without birth certificate	8,153	0.034	0.182	0	1
Current age of the child	8,153	12.39	3.376	7	18
Child is a girl	8,153	0.485	0.500	0	1
4 to 5 children at home	8,153	0.253	0.435	0	1
6 or more children at home	8,153	0.041	0.200	0	1
Children under 6 years	8,153	0.320	0.466	0	1
Mother's schooling in years	8,153	7.365	5.244	0	26
Mother married	8,153	0.217	0.412	0	1
Mother is head of household	8,153	0.338	0.473	0	1
No water/electricity	8,153	0.001	0.038	0	1
Wealth index (0-1)	8,153	0.484	0.147	0.037	1

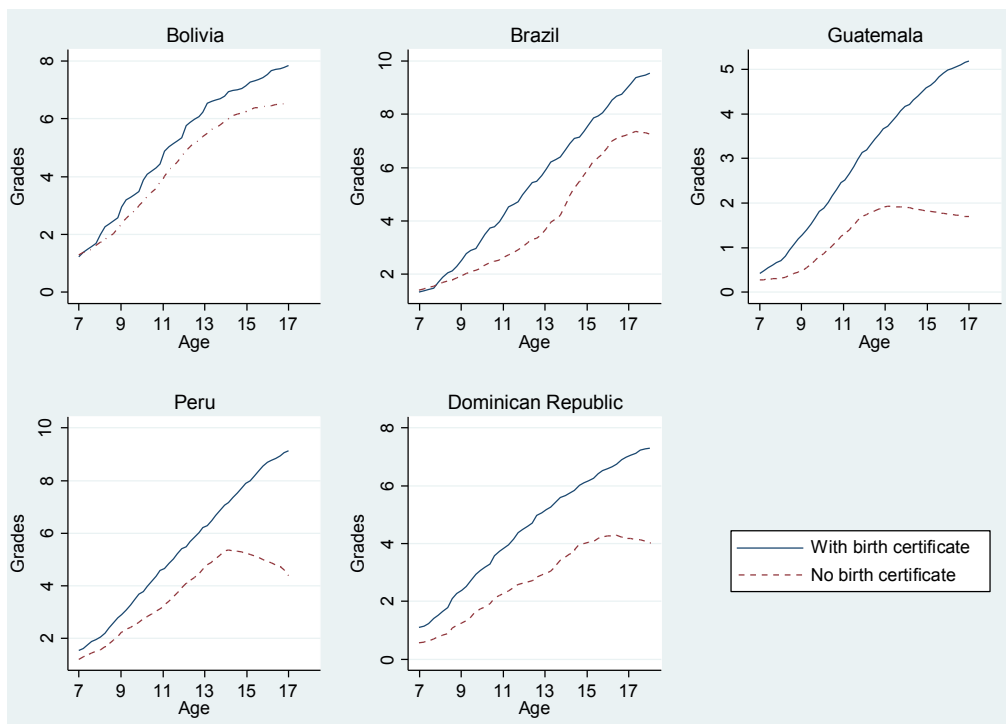
Source: Data from DHS 2007 Dominican Republic.

As mentioned, the right to education is guaranteed by law for children born in the Dominican Republic. However, in practice, there might be obstacles to enrolling a child in school. For instance, some schools may enroll the child by the name dictated verbally by the mother, while others may require legal proof of identity. Especially difficult could be the issuance of graduation diplomas because school officials must confirm the legal name of the child. Qualitative evidence from the living standard measurement survey ENCOVI (Encuesta de Condiciones de Vida, 2004) suggests that lack of a birth certificate is an impediment to school

enrollment. ENCOVI (2004) reveals that, among the children that never enrolled in school, 15 percent stated lacking a birth certificate as the cause—the third most frequent reason.

Figure 4 illustrates that children without birth certificates complete fewer grades and have higher dropout rates than do children with birth certificates in several LAC countries.⁵ Figure 5 shows the case of the Dominican Republic in more detail. It illustrates by wealth quintiles the Kaplan-Meier schooling survival rates in the education ladder for Dominican children aged 7–18. Regardless of the grade level and wealth quintile, children without a birth certificate have lower survival rates in the education ladder than those with a birth certificate. Moreover, most children without a birth certificate do not go to school beyond grade 8, the grade that marks the transition between primary and secondary school. Also, this applies to children without a birth certificate even in the wealthiest quintile.

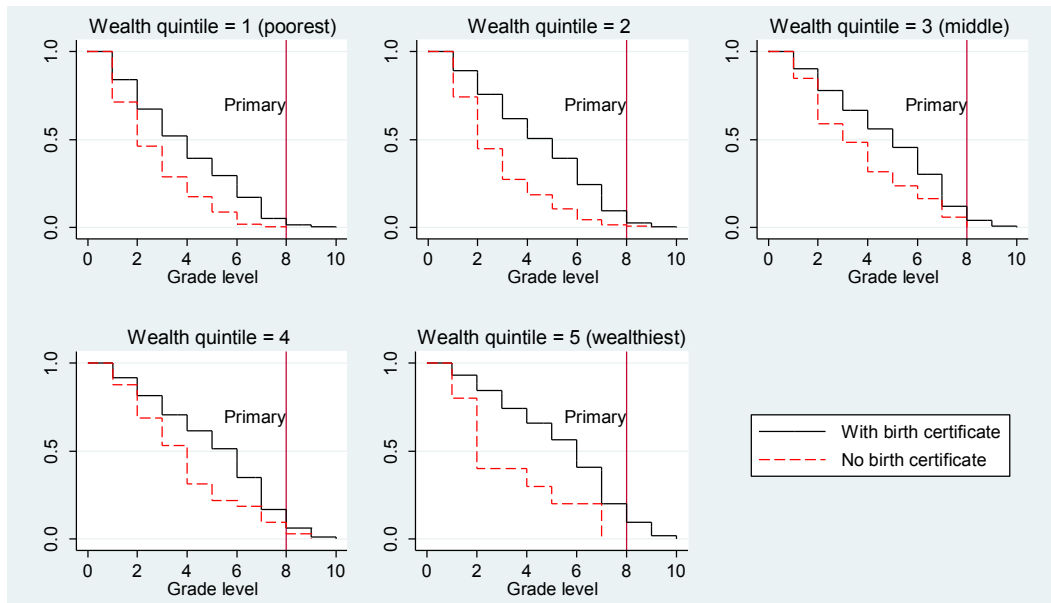
Figure 4. Grades Attained, by Birth Certificate: Local Polynomial Smoothing (Ages 7–18)



Source: Based on Bolivia DHS 2008, Brazil PNAD 2009, Guatemala ENCOVI 2000, Peru DHS 2004–2008, and the Dominican Republic DHS 2007.

⁵ We do not include other countries in this study because we lack the data on instrumental variables to be able to offer a causal explanation. Arcos et al. (forthcoming) explore correlations between birth registration and education and health outcomes for all countries.

Figure 5. Dominican Republic Kaplan-Meier Schooling Survival Estimates, by Birth Certificate (Ages 7–18)



Source: Based on the Dominican Republic DHS 2007.

Empirical Strategy and Results

The data described above motivates several questions: Do children without birth certificates ever enter the education system? At what stage of the schooling ladder does lack of a birth certificate become a critical barrier? And, finally, what is the impact of birth registration on overall educational attainment?

To address these questions, we ran several econometric models using five dependent variables that track progress in different stages of the school system. The first variable takes the value of 1 if the child ever entered the system and 0 if he/she has never been in school. The second variable is also binary and looks at whether the child is currently enrolled in school (primary or secondary). The third and fourth variables—also binary—concentrate on completion rates in the two cycles of mandatory primary education. Finally, total grades attained is a categorical variable coded from 0 to the maximum value for a child of a certain age. The empirical strategy uses different limited dependent variable models that relate education outcomes to birth registration, children’s characteristics, mother’s characteristics, and other controls frequently used in the education literature. We also ran the models for different age groups depending on the stage in the education ladder.

Our empirical strategy takes into account potential endogeneity for our variable of interest: lack of a birth certificate. School enrollment may increase the incentive to register a child's birth, generating reverse causality. For example, parents may register their children's birth to ensure their scholar progress for fear of being turned away if incapable of presenting legal proof of identification. In this case, the association between schooling and birth certificates would increase if schooling increases the number of children with birth certificates.⁶ So, even if the lack of a birth certificate does not affect schooling, we would observe a statistically significant coefficient in a regression of schooling on the lack of a birth certificate. More precisely, we would observe a negative and significant effect of lack of a birth certificate on schooling. This would be a form of downward bias, away from zero (or toward more negative values).

Another source of endogeneity could be unobserved persistent heterogeneity, such as factors that affect education outcomes and the possession of a birth certificate at the same time but that are omitted from the regression. Besides underprivileged conditions, this could include the locations of schools and civil registries, infrastructure, and preference for education and birth registration. As in the first case of endogeneity, the coefficient of a regression of schooling on lack of a birth certificate would be biased downward.

To address this potential endogeneity, we used two instrumental variables: (i) distance from the household cluster to the civil registry office and (ii) whether or not the mother has a document of identification—known as *cédula de identidad*. There are several mechanisms through which distance to the registry office may decrease chances of a parent registering a child's birth. A straightforward one is transportation costs. Another may be lower access to information about the necessary steps and requirements to obtain a birth certificate. Regardless of the mechanism, following Corbacho and Osorio (2012), we use GPS-measured distance from the cluster of households to the civil registry office as an instrumental variable of whether or not a child has a birth certificate.⁷ Corbacho and Osorio (2012) also find that lack of legal identity of the mother explains the lack of birth certificates for her children, since it is one of the prerequisites to register a child's birth. In this respect, all children born on Dominican soil have the right to be Dominicans and receive their identification documents regardless of the

⁶ In this respect, there is also a program known as “*Acta de Nacimiento*” that aims to provide birth certificates to children currently attending school. Unfortunately, we are unable to observe this variable in the DHS survey.

⁷ The DHS contains a random error in the position of the cluster of households. This is done to protect the confidentiality of the household's members. See <http://measuredhs.com/faq.cfm> for more details.

nationality of their parents (the principle of *jus solis*). However, to register the birth of a child, parents themselves need to show documents of legal identity.⁸ After controlling for other determinants of education, these two variables should not be expected to have an independent effect on education, while being good predictors of birth registration.

We checked the validity of the instruments in relation to several potential threats to our identification strategy using a variety of tests and by including the excluded instrumental variables as controls in separate regressions. The first threat relates to the fact that distance to the civil registry may capture unobservable variables that also affect education. For instance, the location of civil registries could be correlated with the location of schools, access to labor markets, or infrastructure. Children living at long distance from the civil registry office might also be living at a long distance from a school, which is not observed in our dataset. If this happens, distance to civil registries would not be orthogonal to these unobserved factors, a crucial requirement for a valid instrumental variable. Still, in the Dominican Republic, the number of schools far exceeds the number of civil registries, and the civil registries are much more scattered and less available than schools (159 civil registries versus 11,402 schools).⁹ To further mitigate this potential threat, we restricted the analysis to urban areas. In the tables that follow, we also report the Hansen test of over-identification to see if the excluded instrumental variables were correlated with the error term, evidence that would cast doubt on the validity of these instruments. Moreover, we tested if these excluded instrumental variables had any direct effect on the education variables (other than the indirect effect through the endogenous variable) to confirm that they were correctly excluded from the main specification.

The second threat relates to the possibility that mothers without national identity cards are primarily of Haitian origin. There could be a myriad of factors, such as language, culture, and prejudice against Haitians, which are adversely affecting education. To address this second threat, we ran the regressions excluding from the sample children of parents born abroad.

Finally, to control for other unobservable factors that might be correlated with education, we included department, municipality, and household dummies.

⁸ This requirement represents a challenge for Haitians who usually immigrate undocumented. For undocumented immigrants, the difficulty in obtaining birth certificates was made more explicit in 2007 when the Electoral Central Board (*Junta Central Electoral*, JCE) prohibited (in resolution 017-2007) the Civil Registry from issuing birth certificates to children of foreigners without legal residency.

⁹ <http://www.see.gob.do/documentosminerd/Planificacion/>

First Stage: Distance and Mother's Document of Identification

The first stage of our analysis looked at the question: *Do distance to civil registry offices and mother's document of identification predict children's birth registration?*

Although Corbacho and Osorio (2012) already uncovered a strong correlation between distance to the civil registry office and under-registration of births in Bolivia and the Dominican Republic, our analysis is limited to urban areas. For this reason, in Table 2 we report the correlation between distance to the nearest civil registry and the mother's lack of a document of identification with under-registration of births using OLS regressions, limiting the sample to urban areas. Distance and mother's document of identification are positively and significantly correlated with a child's lack of a birth certificate. When we added more controls, the coefficients were estimated with more precision, but, as expected, the size of the effects is reduced. We also controlled for department and municipal district dummies.¹⁰ When we added municipal district dummies, the variable distance lost its significance, but the mother's document of identification continued to be significant. To see the strength of the correlation between lack of a birth certificate and the instrumental variables, we report results for the under-identification and weak identification tests in the main regressions (at the bottom of Tables 3–7).

¹⁰ Distance from the cluster of household to the nearest civil registry office varies only at the cluster level and the mother's document of identification at the household level, so we cannot include dummies at the household level.

Table 2. First Stage: Effect of Distance and Mother's Identification Document on Lack of Birth Certificate (Ages 7–18)

Dependent variable: 1 if child does not have a birth certificate, 0 otherwise	(1) OLS	(2) OLS	(3) OLS	(4) OLS
<i>Excluded Instruments:</i>				
Distance to nearest registry in km (1 unit =25km)	0.085*** (0.018)	0.070*** (0.018)	0.086** (0.044)	0.046 (0.043)
Mother does not have ID	0.474*** (0.015)	0.430*** (0.015)	0.484*** (0.015)	0.439*** (0.015)
<i>Rest of Controls:</i>				
Current age of the child		-0.003*** (0.001)		-0.003*** (0.001)
Child is a girl		-0.002 (0.004)		-0.002 (0.004)
Mother's schooling in years		-0.002*** (0.000)		-0.002*** (0.000)
Mother married		0.006 (0.005)		0.006 (0.005)
Mother is head of household		0.004 (0.004)		0.005 (0.004)
4 to 5 children at home		0.019*** (0.005)		0.018*** (0.005)
6 or more children at home		0.039*** (0.010)		0.044*** (0.010)
Children under 6 years		0.010** (0.004)		0.010** (0.004)
Wealth index		-0.410*** (0.068)		-0.434*** (0.071)
Wealth squared		0.295*** (0.065)		0.324*** (0.067)
No water/electricity		0.029 (0.049)		0.031 (0.049)
Constant	0.029*** (0.007)	0.200*** (0.020)	0.029*** (0.008)	0.209*** (0.021)
Department dummies	Yes	Yes	No	No
Municipal district dummies	No	No	Yes	Yes
Observations	8153	8153	8153	8153
R^2	0.134	0.161	0.169	0.195

Notes: All are OLS regressions marginal effects; Standard errors in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. We cannot control for household dummies because the variable *Distance to nearest registry* varies at the cluster of household level, and the variable *Mother does not have ID* varies at the household level, so both would fall out of the regression if household dummies were included.

Second Stage: Impact of Birth Registration on Education

The second stage of our analysis looked at the question: *What is the impact of birth registration on education?*

For entrance, enrollment, and graduation rates, the basic empirical specification is:

$$E_i = \beta_0 + NoBirthCert_i\beta_1 + X_i\beta_2 + \gamma_j + \varepsilon_i \quad (1)$$

where E_i is the binary education variable of child i ; $NoBirthCert_i$ is a binary variable that indicates if the child i does not have a birth certificate; X_i is a list of controls; γ_j are household dummies in some regressions, department and municipal district dummies in others; and ε_i is the error of the equation. We used OLS, PROBIT, and IVPROBIT models to account for endogeneity of birth certificates and for the fact that entrance is a qualitative binary variable.

The IVPROBIT model follows Rivers and Vuong (1988) to ensure consistency of the estimates in the presence of a binary endogenous explanatory variable (lack of birth certificate) in a binary dependent variable model (e.g., entrance, enrollment, and graduation). Several recent highly regarded papers have used this procedure in non-linear models to answer a diversity of research questions when the endogenous variable is dichotomous (see Jacoby, 1997; Elbadawi and Sambinas, 2002; McKenzie and Rapoport, 2011).

The Rivers and Vuong (1988) procedure consists of the following steps:

- i) Estimation of an OLS model on the two instrumental variables plus other controls, using $NoBirthCert_i$ as the dependent variable, and obtain the estimated errors $\hat{\vartheta}$.
- ii) Estimation of a PROBIT model with E_i as the dependent variable and including $\hat{\vartheta}$ as an additional control variable.

According to Rivers and Vuong (1988), the coefficients in the second step are consistent. However, if in the second step the estimated coefficient of $\hat{\vartheta}$ is significant, the standard errors and t statistics are not valid. In this case, only the magnitude of the coefficient of interest in the second stage has been estimated correctly. We report marginal coefficients as they are easier to interpret in the case of non-linear models.

It seems natural to start the analysis by asking if those children without a birth certificate enter the education system (Table 3) and are currently enrolled in school (Table 4). Column 1 contains a basic OLS specification with household dummies, but the coefficient of the variable

Child without birth certificate is not significant despite the fact that other regressions without household dummies show it as significant at the 1 percent level. Perhaps omitted relevant factors at the household level causes this correlation, so once we control for household dummies, this correlation disappears. The R^2 is very large in Column 1 compared to the one in the regressions without household dummies, which could indicate that a large part of the variation in entrance and enrollment is explained by unobserved heterogeneity. Another explanation for the lack of statistical significance could be that identification relies on the existence of children in the same household differing on possession of a birth certificate and entrance to or enrollment in school, but given that over 90 percent of the children enter or enroll, there is little variation to explain our question of interest. In contrast, in the other regression, identification relies on variation across children in different households.

Thus, based on the evidence presented in Tables 3 and 4, we cannot reject the null hypothesis that children without a birth certificate are able to enter the education system or enroll in school. This is consistent with the facts stated above that schools were accepting children without a birth certificate even before the change in legislation that eliminated the requirement to present documents of identification.

We then examined if not having a birth certificate reduces the probability of completing the two cycles of primary school. The first cycle finishes at age 10, so we looked at children 11 years and older. The results are presented in Table 5. In all regressions the coefficient is highly significant at the 1 percent level. Column 1 shows the regression that includes household dummies. The fact that the coefficient of the variable *Child without birth certificate* is significant is indeed a remarkable finding because it is an indication that the possible upward bias due to unobserved heterogeneity does not explain the correlation observed. It is also noticeable that the R^2 of the regression changes substantially (from 0.77 to 0.33), despite the fact that the coefficient does not change much (from 0.23 to 0.27). This means that a large part of the variation of the dependent variable is explained by the household dummies, but not at the expense of leaving the variable *child without birth certificate* without room to explain part of the variation of the dependent variable. The sole conclusion here is that the correlation between the lack of a birth certificate and not passing the first cycle of primary school is robust after controlling for household dummies that capture unobserved heterogeneity at the household level.

Table 3. Effect of Not Having Birth Certificate on Entrance (Ages 7–18)

Dependent variable: 1 if is/was enrolled in primary school, 0 otherwise	(1) OLS	(2) OLS	(3) OLS	(4) 2SLS	(5) PROBIT	(6) IVPROBIT	(7) PROBIT	(8) IVPROBIT
Child without birth certificate	-0.066 (0.043)	-0.091*** (0.020)	-0.091*** (0.020)	-0.091*** (0.020)	-0.034*** (0.010)	0.006 (0.006)	-0.040*** (0.013)	0.008 (0.007)
Current age of the child	0.005*** (0.001)	0.005*** (0.001)	0.005*** (0.001)	0.005*** (0.001)	0.003*** (0.000)	0.003*** (0.000)	0.004*** (0.000)	0.004*** (0.000)
Child is a girl	0.006 (0.005)	0.007** (0.003)	0.007** (0.003)	0.007** (0.003)	0.005*** (0.002)	0.005*** (0.002)	0.007*** (0.002)	0.007*** (0.002)
Mother's schooling in years		0.001* (0.000)	0.001** (0.000)	0.001** (0.000)	0.000** (0.000)	0.001** (0.000)	0.001** (0.000)	0.001** (0.000)
Mother married		0.004 (0.004)	0.004 (0.004)	0.004 (0.004)	0.003 (0.003)	0.003 (0.003)	0.004 (0.003)	0.004 (0.003)
Mother is head of household		0.002 (0.004)	0.003 (0.004)	0.003 (0.004)	0.002 (0.002)	0.002 (0.002)	0.002 (0.002)	0.002 (0.002)
4 to 5 children at home		-0.001 (0.004)	-0.001 (0.004)	-0.001 (0.004)	-0.001 (0.002)	-0.001 (0.002)	-0.001 (0.003)	-0.001 (0.003)
6 or more children at home		-0.015 (0.014)	-0.015 (0.013)	-0.017 (0.013)	-0.004 (0.005)	-0.007 (0.006)	-0.005 (0.006)	-0.008 (0.007)
Children under 6 years		0.001 (0.004)	0.001 (0.004)	0.001 (0.004)	0.000 (0.002)	-0.000 (0.002)	0.000 (0.002)	-0.000 (0.003)
Wealth index		0.369*** (0.082)	0.344*** (0.078)	0.343*** (0.077)	0.099*** (0.032)	0.117*** (0.034)	0.150*** (0.040)	0.171*** (0.043)
Wealth squared		-0.286*** (0.070)	-0.266*** (0.068)	-0.266*** (0.067)	-0.057* (0.032)	-0.073** (0.033)	-0.096** (0.039)	-0.114*** (0.041)
No water/electricity		-0.049 (0.067)	-0.041 (0.067)	-0.034 (0.066)	-0.005 (0.017)	-0.002 (0.014)	-0.010 (0.025)	-0.005 (0.020)
Estimated error						-0.028** (0.013)		-0.034** (0.017)
Constant	0.915*** (0.015)	0.796*** (0.026)	0.803*** (0.025)	0.804*** (0.024)				
Household dummies	Yes	No	No	No	No	No	No	No
Department dummies	No	No	Yes	Yes	Yes	Yes	No	No
Municipal district dummies	No	Yes	No	No	No	No	Yes	Yes
<i>Under-identification test:</i>								
Kleibergen-Paap rk LM statistic				77.590				
P-value				0.000				
<i>Weak identification tests:</i>								
Cragg-Donald Wald F-stat				434.19				
Kleibergen-Paap rk F- stat				60.32				
Stock-Yogo (2005) critical value at 10% maximal IV size				19.93				
<i>Over-identification test:</i>								
Hansen J Test				1.60				
P-value				0.44				
Observations	8153	8153	8153	8153	8153	8153	6259	6259
R^2	0.609	0.062	0.048	0.045				
Pseudo R^2					0.176	0.178	0.197	0.199

Marginal effects; Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Columns 7 and 8 drop some observations because of the under-identification problem in PROBIT/LOGIT models as some variables (in this case the large number of dummies) predict perfectly the outcome. The IVPROBIT model uses the procedure described in Rivers and Vuong (1988).

Table 4. Effect of Not Having a Birth Certificate on School Enrollment (Ages 7–18)

Dependent variable: 1 if enrolled in school, 0 otherwise	(1) OLS	(2) OLS	(3) OLS	(4) 2SLS	(5) PROBIT	(6) IVPROBIT	(7) PROBIT	(8) IVPROBIT
Child without birth certificate	-0.076 (0.058)	-0.154*** (0.027)	-0.162*** (0.026)	-0.161*** (0.026)	-0.131*** (0.025)	-0.237* (0.124)	-0.126*** (0.026)	-0.227* (0.126)
Current age of the child	-0.009*** (0.002)	-0.009*** (0.001)	-0.009*** (0.001)	-0.009*** (0.001)	-0.008*** (0.001)	-0.008*** (0.001)	-0.008*** (0.001)	-0.008*** (0.001)
Child is a girl	0.020** (0.009)	0.025*** (0.006)	0.026*** (0.006)	0.026*** (0.006)	0.023*** (0.005)	0.023*** (0.005)	0.024*** (0.006)	0.024*** (0.006)
Mother's schooling in years		0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)
Mother married		0.008 (0.007)	0.007 (0.007)	0.007 (0.007)	0.008 (0.007)	0.008 (0.007)	0.008 (0.008)	0.008 (0.008)
Mother is head of household		0.013** (0.007)	0.012* (0.007)	0.013* (0.007)	0.008 (0.006)	0.009 (0.006)	0.010 (0.006)	0.010 (0.006)
4 to 5 children at home		-0.006 (0.008)	-0.007 (0.008)	-0.007 (0.008)	-0.005 (0.006)	-0.004 (0.006)	-0.004 (0.007)	-0.004 (0.007)
6 or more children at home		-0.016 (0.020)	-0.025 (0.020)	-0.024 (0.020)	-0.019 (0.015)	-0.015 (0.015)	-0.013 (0.016)	-0.009 (0.015)
Children under 6 years		0.010 (0.007)	0.007 (0.007)	0.007 (0.007)	0.006 (0.006)	0.007 (0.006)	0.009 (0.007)	0.010 (0.007)
Wealth index		0.797*** (0.129)	0.709*** (0.128)	0.705*** (0.127)	0.512*** (0.093)	0.484*** (0.099)	0.607*** (0.098)	0.580*** (0.102)
Wealth squared		-0.590*** (0.115)	-0.516*** (0.115)	-0.511*** (0.114)	-0.346*** (0.092)	-0.322*** (0.095)	-0.422*** (0.095)	-0.400*** (0.098)
No water/electricity		-0.100 (0.083)	-0.070 (0.088)	-0.072 (0.088)	-0.037 (0.073)	-0.041 (0.076)	-0.115 (0.097)	-0.119 (0.099)
Estimated error						0.047 (0.048)		0.046 (0.050)
Constant	1.021*** (0.022)	0.767*** (0.039)	0.794*** (0.038)	0.794*** (0.038)				
Household dummies	Yes	No	No	No	No	No	No	No
Department dummies	No	No	Yes	Yes	Yes	Yes	No	No
Municipal district dummies	No	Yes	No	No	No	No	Yes	Yes
<i>Under-identification test:</i>								
Kleibergen-Paap rk LM stat				67.2				
P-value				0.000				
<i>Weak identification tests:</i>								
Cragg-Donald Wald F stat				819.8				
Kleibergen-Paap rk F stat				105.9				
Stock-Yogo (2005) critical value at 10% maximal IV size				16.38				
<i>Over-identification test:</i>								
Hansen J Test				1.60				
P-value				0.20				
Observations	8094	8094	8094	8094	8094	8094	7426	7426
R ²	0.733	0.135	0.076	0.072				
Pseudo R ²					0.121	0.121	0.165	0.165

Marginal effects; Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Columns 7 and 8 drop some observations because of the under-identification problem in PROBIT/LOGIT models as some variables (in this case the large number of dummies) predict perfectly the outcome. The IVPROBIT model uses the procedure described in Rivers and Vuong (1988).

Table 5. Effect of Not Having Birth Certificate on Passing First Cycle Primary School (Ages 11–18)

Dependent variable: 1 if child passed first cycle, 0 otherwise	(1) OLS	(2) OLS	(3) OLS	(4) 2SLS	(5) PROBIT	(6) IVPROBIT	(7) PROBIT	(8) IVPROBIT
Child without birth certificate	-0.227*** (0.084)	-0.273*** (0.037)	-0.274*** (0.036)	-0.329*** (0.114)	-0.281*** (0.052)	-0.436** (0.221)	-0.289*** (0.055)	-0.393* (0.217)
Current age of the child	0.068*** (0.005)	0.068*** (0.002)	0.068*** (0.002)	0.069*** (0.002)	0.067*** (0.002)	0.067*** (0.003)	0.072*** (0.003)	0.072*** (0.003)
Child is a girl	0.104*** (0.019)	0.112*** (0.009)	0.111*** (0.009)	0.111*** (0.009)	0.115*** (0.010)	0.115*** (0.010)	0.123*** (0.010)	0.123*** (0.010)
Mother's schooling in years		0.008*** (0.001)	0.008*** (0.001)	0.008*** (0.001)	0.009*** (0.001)	0.009*** (0.001)	0.009*** (0.001)	0.009*** (0.001)
Mother married		0.027** (0.012)	0.028** (0.012)	0.027** (0.012)	0.033*** (0.013)	0.032** (0.013)	0.036*** (0.013)	0.035*** (0.013)
Mother is head of household		-0.007 (0.012)	-0.009 (0.011)	-0.010 (0.011)	-0.008 (0.011)	-0.008 (0.011)	-0.009 (0.012)	-0.008 (0.012)
4 to 5 children at home		-0.059*** (0.013)	-0.054*** (0.012)	-0.054*** (0.012)	-0.050*** (0.012)	-0.048*** (0.012)	-0.056*** (0.013)	-0.055*** (0.013)
6 or more children at home		-0.099*** (0.030)	-0.106*** (0.029)	-0.105*** (0.029)	-0.105*** (0.031)	-0.099*** (0.031)	-0.101*** (0.033)	-0.096*** (0.034)
Children under 6 years		-0.010 (0.013)	-0.008 (0.013)	-0.009 (0.013)	-0.003 (0.011)	-0.001 (0.011)	-0.005 (0.012)	-0.004 (0.012)
Wealth index		1.595*** (0.192)	1.519*** (0.188)	1.521*** (0.187)	0.780*** (0.211)	0.739*** (0.219)	0.986*** (0.229)	0.959*** (0.237)
Wealth squared		-1.020*** (0.171)	-0.943*** (0.167)	-0.945*** (0.167)	-0.213 (0.218)	-0.179 (0.223)	-0.396* (0.234)	-0.374 (0.239)
No water/electricity		0.090 (0.111)	0.109 (0.130)	0.111 (0.130)	0.077 (0.062)	0.076 (0.064)	0.076 (0.057)	0.075 (0.058)
Estimated error						0.085 (0.115)		0.058 (0.114)
Constant	-0.236*** (0.069)	-0.815*** (0.063)	-0.804*** (0.061)	-0.807*** (0.061)				
Household dummies	Yes	No	No	No	No	No	No	No
Department dummies	No	No	Yes	Yes	Yes	Yes	No	No
Municipal district dummies	No	Yes	No	No	No	No	Yes	Yes
<i>Under-identification test:</i>								
Kleibergen-Paap rk LM stat				36.9				
P-value				0.000				
<i>Weak identification tests:</i>								
Cragg-Donald Wald F stat				247.6				
Kleibergen-Paap rk F stat				27.47				
Stock-Yogo (2005) critical value at 10% maximal IV size				19.9				
<i>Over-identification test:</i>								
Hansen J Test				1.85				
P-value				0.17				
Observations	5392	5392	5392	5392	5392	5392	5119	5119
R ²	0.768	0.325	0.299	0.299				
Pseudo R ²					0.334	0.334	0.355	0.355

Marginal effects; Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Columns 7 and 8 drop some observations because of the under-identification problem in PROBIT/LOGIT models as some variables (in this case the large number of dummies) predict perfectly the outcome. The IVPROBIT model uses the procedure described in Rivers and Vuong (1988).

At this point, the potential endogeneity caused by reverse causation cannot be discarded, so we cannot conclude that this correlation implies causation. Next, we dropped the household dummies and introduced instrumental variables along with municipal district and department dummies. Columns 4, 6, and 8 introduce different specifications with instrumental variables and show a coefficient that ranges from 33 percent to around 40 percent. The tests of under-identification and weak identification reject the null hypothesis that the instruments are weakly

correlated with the endogenous variable. In fact, the Cragg-Donald F statistic is 248, which is significantly larger than the recommended F-statistic of 20 reported in Stock and Yogo (2005) or the rule of thumb of 10. Another concern is that the instruments are picking up unobserved heterogeneity that affects education, but the null hypothesis that the instrumental variables are not correlated with the error term and therefore correctly excluded from the model (Hansen test) cannot be rejected even at the 10 percent level. Therefore, after ruling out that the significance of the coefficient is caused by some form of endogeneity, we conclude that lacking a birth certificate reduces the probability of passing the first cycle of primary school. More specifically, a child without a birth certificate would have between 20 and 40 percentage points lower probability of passing the first cycle of primary school than a child with birth certificate.

Table 6 looks at passing the second cycle of primary school. The age range is restricted to 15–18 because it is at age 14 that Dominicans ought to have finished the second cycle of primary school. Column 1, which includes household dummies, shows an insignificant effect of not having a birth certificate, but we suspect that this is because identification relies on households with a least two children where at least one has a birth certificate, and too few households satisfy this condition in the corresponding age range to identify coefficients with household dummies. Another possibility is that the degrees of freedom are reduced after introducing thousands of dummies and the variance of the coefficients increases, leaving small t-statistics. The rest of the columns show statistically significant effects, but given that column 1 casts doubt on the significance of the variable *child without birth certificate*, we cannot confidently claim that lacking a birth certificate reduces the chances of passing the second cycle of primary school.

The last issue we analyze is the effect of birth registration on overall schooling attainment measured by total grades completed. For this purpose, we estimated a treatment effect model that considers an endogenous binary variable (birth certificate) on a continuous dependent variable (grades).¹¹ The primary regression equation in this treatment model is:

$$Grades_i = \beta_0 + NoBirthCert_i\beta_1 + X_i\beta_2 + \gamma_j + \varepsilon_i \quad (2)$$

where $NoBirthCert_i$ is the binary variable of lack of a birth certificate. In a first stage, the binary variable $NoBirthCert_i$ is regressed against the instrumental variables distance to civil registry and mother's document of identification, as well as the controls used in the primary

¹¹ See Maddala (1983) for a reference of the derivation of the maximum likelihood function of this model. We used the command `treatreg` in the econometric software STATA.

regression. The first stage is estimated with a PROBIT model jointly with regression equation (2) through maximum likelihood estimation (MLE). McKenzie and Sakho (2010) recently used this type of model.

Table 6. Effect of Not Having Birth Certificate on Passing Second Cycle Primary School (Ages 15–18)

Dependent variable: 1 if child passed second cycle, 0 otherwise	(1) OLS	(2) OLS	(3) OLS	(4) 2SLS	(5) PROBIT	(6) IVPROBIT	(7) PROBIT	(8) IVPROBIT
Child without birth certificate	0.013 (0.278)	-0.229*** (0.054)	-0.249*** (0.048)	-0.253*** (0.047)	-0.393*** (0.075)	-0.517*** (0.078)	-0.381*** (0.087)	-0.500*** (0.114)
Current age of the child	0.143*** (0.020)	0.131*** (0.008)	0.128*** (0.008)	0.129*** (0.007)	0.168*** (0.011)	0.167*** (0.011)	0.183*** (0.011)	0.182*** (0.011)
Child is a girl	0.110** (0.054)	0.157*** (0.017)	0.160*** (0.017)	0.160*** (0.017)	0.208*** (0.022)	0.207*** (0.022)	0.218*** (0.023)	0.217*** (0.023)
Mother's schooling in years		0.014*** (0.002)	0.014*** (0.002)	0.014*** (0.002)	0.019*** (0.003)	0.019*** (0.003)	0.020*** (0.003)	0.020*** (0.003)
Mother married		0.012 (0.025)	0.027 (0.024)	0.027 (0.024)	0.045 (0.032)	0.042 (0.032)	0.027 (0.034)	0.025 (0.034)
Mother is head of household		-0.037* (0.022)	-0.041* (0.021)	-0.042** (0.021)	-0.057** (0.028)	-0.054* (0.028)	-0.058** (0.029)	-0.056* (0.030)
4 to 5 children at home		-0.074*** (0.023)	-0.069*** (0.022)	-0.069*** (0.022)	-0.082*** (0.029)	-0.077*** (0.029)	-0.090*** (0.031)	-0.086*** (0.032)
6 or more children at home		-0.092* (0.047)	-0.099** (0.045)	-0.099** (0.045)	-0.130** (0.062)	-0.118* (0.064)	-0.133** (0.066)	-0.123* (0.069)
Children under 6 years		0.024 (0.027)	0.011 (0.025)	0.011 (0.025)	0.004 (0.033)	0.009 (0.034)	0.014 (0.036)	0.018 (0.037)
Wealth index		1.346*** (0.327)	1.208*** (0.305)	1.209*** (0.302)	1.290** (0.521)	1.157** (0.543)	1.684*** (0.573)	1.572*** (0.596)
Wealth squared		-0.316 (0.302)	-0.199 (0.282)	-0.200 (0.279)	0.020 (0.498)	0.128 (0.514)	-0.282 (0.543)	-0.191 (0.559)
No water/electricity		-0.400*** (0.046)	-0.380*** (0.083)	-0.380*** (0.082)				
Estimated error						0.314 (0.335)		0.264 (0.374)
Constant	-1.859*** (0.329)	-2.364*** (0.150)	-2.283*** (0.143)	-2.285*** (0.142)				
Household dummies	Yes	No	No	No	No	No	No	No
Department dummies	No	No	Yes	Yes	Yes	Yes	No	No
Municipal district dummies	No	Yes	No	No	No	No	Yes	Yes
<i>Under-identification test:</i>								
Kleibergen-Paap rk LM stat				11.59				
P-value				0.003				
<i>Weak identification tests:</i>								
Cragg-Donald Wald F stat				80.34				
Kleibergen-Paap rk F stat				7.9				
Stock-Yogo (2005) critical value at 10% maximal IV size				19.9				
<i>Over-identification test:</i>								
Hansen J Test				0.144				
P-value				0.704				
Observations	2576	2576	2576	2576	2576	2576	2483	2483
R ²	0.898	0.340	0.288	0.288				
Pseudo R ²					0.245	0.246	0.277	0.278

Marginal effects; Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Columns 7 and 8 drop some observations because of the under-identification problem in PROBIT/LOGIT models as some variables (in this case the large number of dummies) predict perfectly the outcome. The IVPROBIT model uses the procedure described in Rivers and Vuong (1988).

The marginal effects in Table 7 show that children without birth a certificate attain fewer grades of education. This occurs even after controlling for household and municipal dummies and other controls, such as family wealth and mother's education. Column 1 of Table 7 shows

coefficients with household dummies. The estimate suggests that not having a birth certificate reduces the number of grades passed by 0.75. Columns 2 to 7 contain regressions with department and municipal dummies and larger marginal effects, albeit after dropping household dummies. This time, however, the instrumental variable using the MLE shows a drop (in absolute terms) in the marginal effects from 0.75 to 0.51, revealing the type of bias expected with a simple OLS specification. Provided the regression in Column 1 rules out the possibility that the correlation is due to unobserved factors and that the battery of tests for our instrumental variables do not cast doubt on the validity of the instruments, we conclude that not having a birth certificate reduces the overall educational attainment of a child by at least half a grade.

Table 7. Effect of Not Having Birth Certificate on Grades Attained (Ages 7–18)

Dependent variable: Grades attained	(1) OLS	(2) OLS	(3) 2SLS	(4) MLE	(5) OLS	(6) 2SLS	(7) MLE
Child without birth certificate	-0.746*** (0.260)	-0.944*** (0.109)	-0.945*** (0.109)	-0.806*** (0.231)	-0.936*** (0.111)	-0.930*** (0.109)	-0.514** (0.223)
Current age of the child	0.768*** (0.010)	0.787*** (0.006)	0.787*** (0.006)	0.789*** (0.006)	0.787*** (0.006)	0.787*** (0.006)	0.788*** (0.005)
Child is a girl	0.647*** (0.052)	0.643*** (0.034)	0.644*** (0.034)	0.644*** (0.034)	0.639*** (0.034)	0.641*** (0.034)	0.640*** (0.034)
Mother's schooling in years		0.050*** (0.004)	0.050*** (0.004)	0.054*** (0.004)	0.049*** (0.004)	0.049*** (0.004)	0.050*** (0.004)
Mother married		0.126*** (0.044)	0.125*** (0.044)	0.132*** (0.047)	0.114** (0.044)	0.112** (0.044)	0.111** (0.047)
Mother is head of household		-0.085** (0.037)	-0.085** (0.037)	-0.103*** (0.038)	-0.086** (0.038)	-0.086** (0.038)	-0.088** (0.039)
4 to 5 children at home		-0.254*** (0.043)	-0.253*** (0.043)	-0.235*** (0.042)	-0.264*** (0.045)	-0.262*** (0.044)	-0.270*** (0.043)
6 or more children at home		-0.407*** (0.093)	-0.408*** (0.093)	-0.431*** (0.092)	-0.352*** (0.096)	-0.351*** (0.094)	-0.382*** (0.093)
Children under 6 years		0.007 (0.038)	0.006 (0.037)	-0.021 (0.041)	0.002 (0.039)	0.001 (0.038)	-0.004 (0.041)
Wealth index		6.107*** (0.675)	6.124*** (0.673)	5.894*** (0.628)	6.449*** (0.693)	6.463*** (0.684)	6.742*** (0.660)
Wealth squared		-2.317*** (0.626)	-2.333*** (0.624)	-2.260*** (0.599)	-2.635*** (0.639)	-2.641*** (0.631)	-2.862*** (0.618)
No water/electricity		0.063 (0.391)	0.057 (0.390)	0.104 (0.448)	0.138 (0.387)	0.150 (0.382)	0.129 (0.444)
Constant	-4.660*** (0.126)	-7.663*** (0.190)	-7.669*** (0.189)	-7.497*** (0.178)	-7.734*** (0.196)	-7.743*** (0.193)	-7.860*** (0.201)
Household dummies	Yes	No	No	No	No	No	No
Department dummies	No	Yes	Yes	Yes	No	No	No
Municipal district dummies	No	No	No	No	Yes	Yes	Yes
<i>Under-identification test:</i>							
Kleibergen-Paap rk LM stat			77.5			75.8	
P-value			0.000			0.000	
<i>Weak identification tests:</i>							
Cragg-Donald Wald F stat			431.6			430.4	
Kleibergen-Paap rk F stat			60.3			59.07	
Stock-Yogo (2005) critical value at 10% maximal IV size			19.9			19.9	
<i>Over-identification test:</i>							
Hansen J Test			0.04			1.87	
P-value			0.84			0.17	
Hazard lambda				-0.097 (0.118)			-0.248** (0.119)
Observations	8111	8111	8111	8111	8111	8111	8111
R ²	0.924	0.773	0.773		0.780	0.780	

Marginal effects; Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. MLE refers to the treatment model.

We included the two instrumental variables as controls in basic OLS specifications to see if they had any independent effect on the two outcome variables that seem affected by the lack of a birth certificate. Table A2 in the appendix contains the results and shows that neither the variable *Child without a birth certificate* nor *Mother without ID* have influence on either passing the first cycle of primary school or on total grades attained. This is consistent with the battery of tests reported at the bottom of Tables 5 and 7, thus dismissing doubts about the validity of the instruments. As a last check, the regressions were repeated using a sample consisting only of households that did not declare having children who emigrated from the household. The results were very similar to the ones reported above.

In sum, we find evidence that not having a birth certificate translates into lower educational attainment. While birth registration does not impact the chances of entering the school system, it does causally reduce primary school completion rates and grades attained.

Conclusions

Education is widely recognized as a key engine of economic growth and equality of opportunities. While much has been said about the socioeconomic characteristics that explain children's school achievement, nothing is known about the effect of lack of legal identity on schooling outcomes. This paper is the first to call attention to the detrimental effect of birth under-registration on the educational attainment of children and adolescents in the Dominican Republic. The Dominican Republic is a highly relevant case, since it is the country in the LAC region with the highest percentage of undocumented children and adolescents. We measured education using multiple variables that track the progress along the school ladder.

After addressing the concern of endogeneity, we find that children without a birth certificate have lower chances of graduating from primary school and complete fewer grades overall. For example, among children 11–18 years old who ought to have finished the first cycle of primary education, the probability of advancing to the second cycle is reduced by 0.23 to 40 percentage points for those without a birth certificate. Moreover, there is an education gap between those with and without birth certificates of 0.5 grades. This education gap increases with the age of the children and is never closed.

However, there was no evidence that lacking a birth certificate affects the children's entrance to or enrollment in the education system. This is consistent with the notion that birth certificates are not required to enter school or to enroll but are needed to issue a school diploma.

The fact that entrance to the education system is almost universal suggests that civil registries and schools need to work closely together to provide documents of identification. In fact, schools are much more abundant than civil registry offices. In remote areas, schools could assume the role of the civil registries, especially where birth registration rates are lower, such as near the Dominican-Haitian border (Corbacho and Osorio, 2012).

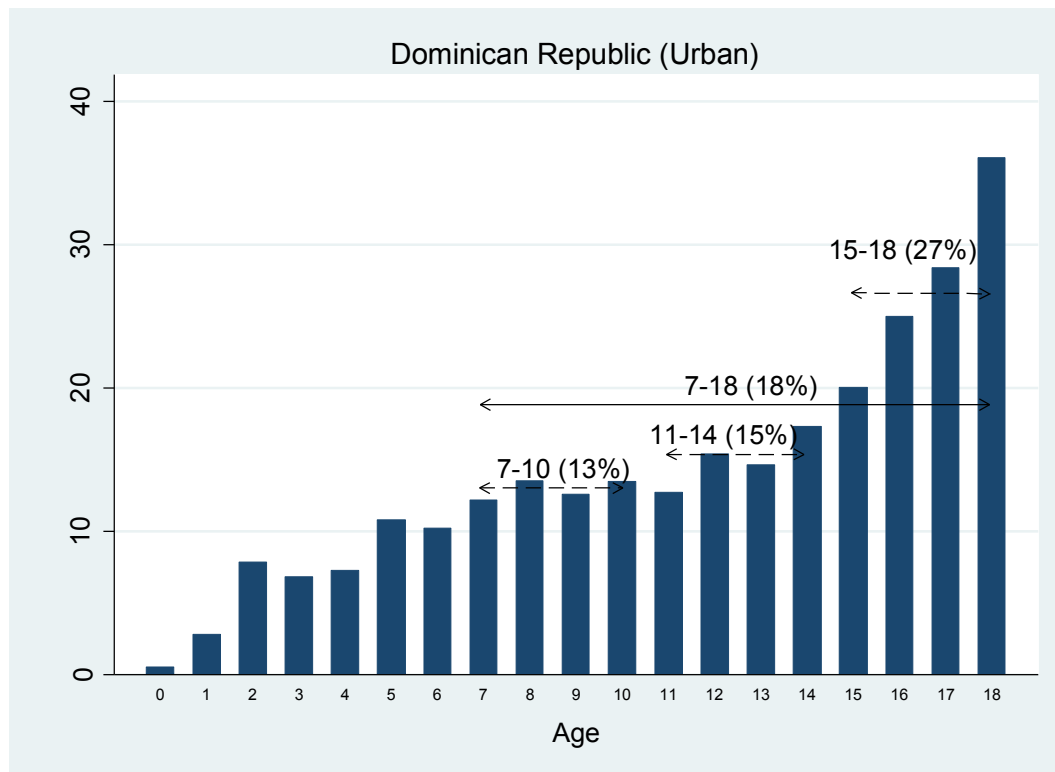
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Appendix

Figure A1. Percentage of Children Living Outside the Home



Source: Data from DHS 2007 Dominican Republic.

**Table A1. Mean Difference of Socioeconomic Characteristics between
Non-migrant and Migrant Children**

Variables	(1) Age 7–18	(2) Age 7–10	(3) Age 11–14	(4) Age 15–18
Current age of the child	-1.426*** (0.08)	-0.063 (0.051)	-0.089* (0.048)	-0.326*** (0.040)
Child is girl	-0.0353*** (0.01)	0.029 (0.022)	0.029 (0.022)	-0.107*** (0.017)
Mother's schooling in years	2.010 *** (0.108)	1.91 *** (0.209)	2.065*** (0.201)	1.988*** (0.168)
Mother married	0.179*** (0.009)	0.193*** (0.01)	0.204*** (0.018)	0.181*** (0.016)
Mother is head of household	-0.0117 (0.012)	-0.029 (0.022)	-0.011 (0.021)	0.012 (0.018)
Wealth quintile (1 to 5)	0.567*** (0.030)	0.620*** (0.059)	0.614*** (0.056)	0.625*** (0.046)
No water/electricity	-0.015*** (0.002)	-0.014*** (0.004)	-0.017*** (0.004)	-0.015*** (0.003)
Distance to the nearest registry in km	-0.116 (0.073)	-0.132 (0.141)	0.001 (0.132)	-0.147 (0.116)
Number of children living in household	8,153	3,003	2,873	2,277
Number of children living elsewhere	2,371	575	663	1,133
Total of children	10,524	3,578	3,536	3,410

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table A2. Do the Instrumental Variables Used (Distance, Mother without ID) Have a Direct Influence on Education?

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
	Passing first cycle primary school Age (11–18)			Grades attained Age (7–18)		
Child without birth certificate	-0.267*** (0.038)	-0.272*** (0.036)	-0.269*** (0.038)	-0.920*** (0.115)	-0.942*** (0.109)	-0.921*** (0.114)
Distance to nearest registry in km	-0.003 (0.002)	-0.003 (0.002)		-0.002 (0.007)	-0.002 (0.007)	
Mother without ID	-0.023 (0.047)		-0.023 (0.048)	-0.102 (0.151)		-0.102 (0.151)
Current age of the child	0.068*** (0.002)	0.068*** (0.002)	0.068*** (0.002)	0.787*** (0.006)	0.787*** (0.006)	0.787*** (0.006)
Child is a girl	0.111*** (0.009)	0.111*** (0.009)	0.111*** (0.009)	0.643*** (0.034)	0.643*** (0.034)	0.643*** (0.034)
Mother's schooling in years	0.008*** (0.001)	0.008*** (0.001)	0.008*** (0.001)	0.050*** (0.004)	0.050*** (0.004)	0.050*** (0.004)
Mother married	0.027** (0.012)	0.027** (0.012)	0.028** (0.012)	0.126*** (0.044)	0.126*** (0.044)	0.126*** (0.044)
Mother is head of household	-0.010 (0.011)	-0.010 (0.011)	-0.009 (0.011)	-0.085** (0.037)	-0.085** (0.037)	-0.085** (0.037)
4 to 5 children at home	-0.055*** (0.012)	-0.054*** (0.012)	-0.055*** (0.012)	-0.255*** (0.043)	-0.254*** (0.043)	-0.255*** (0.043)
6 or more children at home	-0.106*** (0.029)	-0.107*** (0.029)	-0.105*** (0.029)	-0.404*** (0.093)	-0.408*** (0.093)	-0.403*** (0.093)
Children under 6 years	-0.008 (0.013)	-0.008 (0.013)	-0.008 (0.013)	0.008 (0.038)	0.007 (0.038)	0.008 (0.038)
Wealth index	1.506*** (0.188)	1.512*** (0.188)	1.513*** (0.189)	6.055*** (0.682)	6.100*** (0.675)	6.062*** (0.681)
Wealth squared	-0.935*** (0.168)	-0.940*** (0.167)	-0.937*** (0.168)	-2.275*** (0.631)	-2.313*** (0.627)	-2.278*** (0.631)
No water/electricity	0.109 (0.131)	0.109 (0.131)	0.109 (0.130)	0.058 (0.389)	0.062 (0.391)	0.060 (0.389)
Constant	-0.795*** (0.061)	-0.796*** (0.061)	-0.802*** (0.061)	-7.644*** (0.193)	-7.657*** (0.191)	-7.650*** (0.192)
Department dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5392	5392	5392	8111	8111	8111
R^2	0.299	0.299	0.299	0.773	0.773	0.773

OLS regressions. Marginal effects; Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$