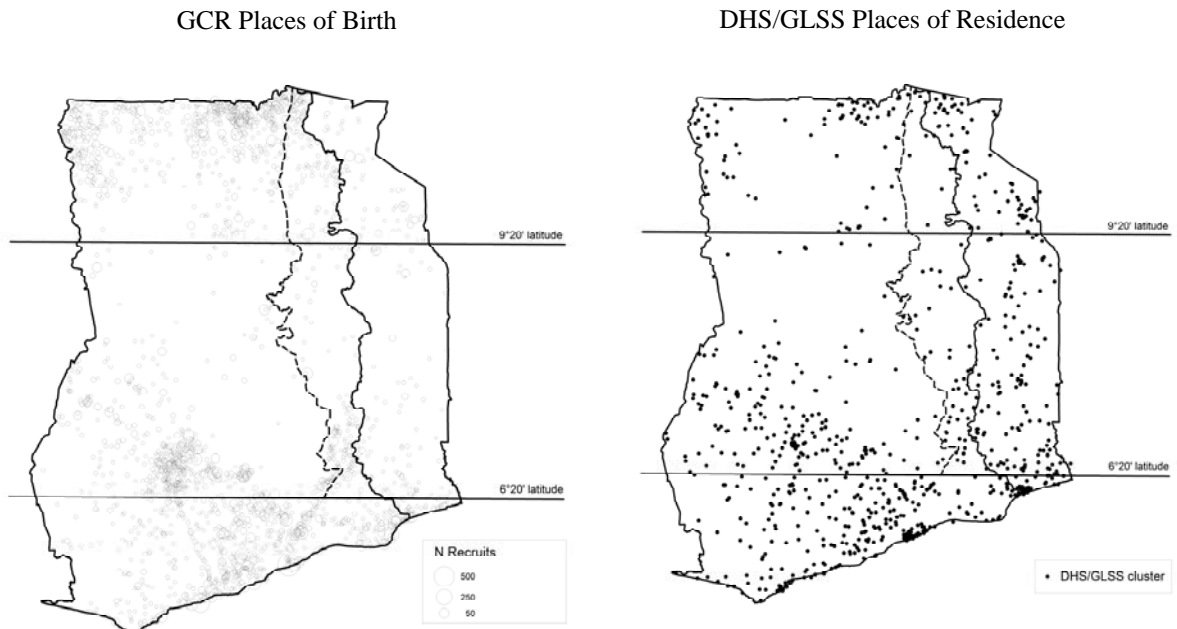


Online Appendix

Appendix 1: Natural and Constructed Geography at the Ghana-Togo Border



APPENDIX FIGURE 1
PLACE OF BIRTH / RESIDENCE IN THE DATA USED

Note: In the Gold Coast Regiment (GCR) data, a dot represents the place of birth of at least one recruit (Moradi 2008). In the Demographic and Health Surveys data, a dot shows the place of residence and is a primary sample unit (PSU) and survey cluster (Macro International).

Appendix Table 1 looks at the differences in natural and constructed geography between the comparison areas, i.e., at the geographical characteristics of the places of birth of GCR recruits (lying within the 100 kilometers bandwidth across the TVT/Togo border and between the 6.3 and 11.3 parallels); here again, we distinguish the Northern (9.3–11.3 latitude) and Southern (6.3–9.3 latitude) subsamples. We use the GCR sample as in our analysis of literacy, Christian religion, or height stature. Even if the GCR is not a representative sample of populations, this analysis differs from a pure look at geographical maps as it takes into account the spatial distribution of people. It allows detecting whether geographical discontinuities could confound our double-difference estimates.

APPENDIX TABLE 1
DIFFERENCES IN NATURAL AND CONSTRUCTED GEOGRAPHY

	Latitude (degrees)	Altitude (meters)	Ruggedness ^d (meters)	Dist. Large Cities ^e 1990 (km)	Dist. Togo Railway ^f (km)	Cocoa 5 km Radius ^g 1927 (tons)
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Simple difference in level^a (pre-1914 cohorts)</i>						
North	+0.00 (0.23)	-5.5 (26.3)	+2.8 (5.5)	+58.3*** (11.6)	-17.6 (23.4)	0 (-)
South	+0.13 (0.50)	+52.4 (48.6)	+2.4 (20.7)	+10.0* (5.9)	-4.1 (34.3)	-130*** (45)
<i>Double-difference pre- and post-1914^b (DID)</i>						
North	-0.16 (0.13)	-28.2* (17.0)	-1.7 (4.8)	-11.7 (7.9)	-17.4 (15.0)	0 (-)
South	+0.06 (0.29)	-76.7** (35.7)	-36.8** (18.0)	-9.1 (6.1)	-1.8 (22.2)	+1.8 (45.4)
<i>Double-difference in trends^c (DiD-T)</i>						
North	-0.018 (0.018)	-2.39 (2.03)	-0.39 (0.58)	-1.18 (0.91)	-1.87 (2.12)	0 (-)
South	-0.051 (0.055)	-3.92 (7.90)	-1.36 (3.08)	-2.76*** (0.93)	-1.67 (2.9)	+14.5* (7.8)
<i>N</i>	428	428	428	428	428	428

* $p < .10$.

** $p < .05$.

*** $p < .01$.

Notes: Clustered standard errors, by place of birth (in parentheses). Cohort sizes reweighted assuming a 2 percent annual demographic growth over 1890–1930, see Table 2 and the text. A positive coefficient means French Togo higher than British TVT.

^a $\delta_2^{pre} - \delta_1^{pre}$, see the text.

^b Double diff. between Fr. Togo and Br. Togoland, $(\delta_2^{post} - \delta_2^{pre}) - (\delta_1^{post} - \delta_1^{pre})$, see Table 2.

^c Coefficient $(\beta_2^{post} - \beta_2^{pre}) - (\beta_1^{post} - \beta_1^{pre})$, in units per year, see the text and Table 3.

^d Terrain ruggedness index for 30-arc-seconds grid. From Nunn and Puga (2012).

^e Cities: Distance and squared distance to the closest city, taking cities with more than 30,000 inhabitants in 1990 (Africapolis): Atakpame, Ho, Kpalime, Lomé, Sokode, and Yendi.

^f Railway: Distance and squared distance to Togo railway lines: For born before 1903, railway line as of 1913; if born after 1924, lines as of 1934; if born between 1903–1924, interpolated.

^g Cocoa: Output and squared output of cocoa beans in 1927, 5 km radius around place of birth (only Gold Coast, French Togo not available).

Source and Coverage: Gold Coast Regiment data. Recruits enlisted 1908–1955, born 1890–1930. Except noted below: Place of birth in former Togoland area, 50 km or less from the border between TVT and Togo, and 6.3 to 9.3 degrees.

Three “natural geography” variables are considered: latitude, altitude, and an index of the “ruggedness” of terrain, taken from Nathan Nunn and Diego Puga.¹ The three other “constructed geography” variables are: (i) the distance to the closest “large city,” defined as counting more than 30,000 inhabitants in 1990; (ii) the distance to the Togo railway lines that started to be built under German rule and were continued under French rule; (iii) the quantity of cocoa produced in a 5 kilometers radius around the place of birth, as of 1927. For each geographical variable in column, the top panel simply reports the average difference in level between the cohorts born before 1914 on each side, in the North and in the South. The middle panel then reports the DiD estimates. The bottom panel reports DiD-T (trend breaks) estimates.

Column 1 shows that no significant differences in latitude can be detected, whether in level or across time. Column 2 shows that southern pre-1914 Togo recruits are born in places that are on average more elevated by 52 meters than birth places of TVT recruits. This latter difference is reversed for post-1914 cohorts, with a significant DiD estimate (−77 meters) meaning that the variation in altitude could be a confounder, in case it has an impact on any of our three outcomes. However no significant double-differences in trends are identified, meaning that altitude should not confound the more refined DiD-T estimates. Column 3 on ruggedness basically brings the same conclusions as for altitude, except that there is no initial difference between pre-1914 places of birth: the DiD estimate signals that southern post-1914 Togo recruits are from less rugged (and less elevated) places, but no double-difference in trends (DiD-T) is detected. For DiD estimates at least, these variations in elevation and in ruggedness could be a concern as Nunn and Puga (2012) have argued that in the African context a more rugged terrain preserved people from slave trade raids. Then post-1914 recruits from TVT would originate from communities who were less affected by the slave trade, and could have ended up with better institutions, “trust,” and/or human capital endowments. We checked that this variation in elevation or slope does not apply to the Ewe ethnic group, whose homeland lies in the less mountainous most southern area, and only to mountain people located between the Volta Lake and the TVT/Togo border. When restricting our estimation to Ewe recruits, as we do in column 1 of Appendix Table 2, we no longer find any significant DiD in altitude or ruggedness. According to Nunn’s figures, the intensity of the slave trade was maximal for the Ewe, the Konkomba in the North coming second.

Last, in Appendix Table 2 below we provide estimates that control for altitude and ruggedness, both in the DiD and the DiD-T specifications (column 3). We find that those controls bring no change, or if anything rather a slight increase in the estimate of the literacy divergence.

We then turn to constructed geography. Column 4 suggests that pre-1914 Togo recruits were born further away from the small towns that turned into large cities (over 30,000 inhabitants) during the post-colonial period (Atakpame, Ho, Kpalime, Lomé, Sokode, and Yendi), especially in the North. In the South, the places of birth of recruits from Togo born before 1914 are on average 10 kilometers further from these future cities. For cohorts born after 1914, this difference more or less cancels out, so that the DiD estimate is negative (−9.1 km) although not significant; yet the DiD-T estimate is also negative and highly significant, reflecting a gain of 2.8 kilometers per year. As distance to urban centers is negatively correlated with literacy, evangelization or health, this kind of variation should generate a downward bias, i.e., attenuate the divergence we observe between TVT and Togo recruits.

¹ We also tried the alternative “slope” measurement, however it is very much correlated with “ruggedness” so that using it instead makes little difference.

APPENDIX TABLE 2
ROBUSTNESS TO GEOGRAPHY
(southern areas)

	50km	25km bw	Latit., Altit. and Rugg. Controls	All South	Cities, Railway and Cocoa	Border RD ^f	Placebo Border RD ^g
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Double-difference pre and post-1914 (DiD)^a</i>							
Literate (%)	-24.8*** (9.5)	-28.1*** (9.3)	-28.1*** (9.5)	-28.6** (9.3)	-24.3** (11.5)	-27.8* (15.1)	-18.9 (18.7)
Christian (%)	-23.2 (16.0)	-28.8 (19.9)	-28.0 (18.8)	-23.9 (17.0)	-29.6** (14.2)	-53.2* (29.6)	-8.2 (20.7)
<i>Double-difference in trends (DiD-T)^b</i>							
Literate (%)	-5.3*** (1.26)	-5.3*** (1.73)	-6.96*** (1.47)	-6.38*** (1.50)	-4.56** (1.83)	-7.17*** (2.62)	+3.29 (2.30)
Christian (%)	-3.13 (3.12)	-0.87 (3.07)	+3.99 (2.46)	+3.15 (2.33)	-4.53 (2.83)	+7.97 (5.01)	+1.49 (2.73)
<i>N</i>	428	255	428	577	428	428	628
Latit., altit. and rugg. ^{c,g}	No	No	Yes	Yes	No	Yes	Yes
Cities, railway and cocoa ^{d,g}	No	No	No	No	Yes	No	No
Distance to border ^{e,f,g}	No	No	No	No	No	Yes	Yes

* $p < .10$.

** $p < .05$.

*** $p < .01$.

^a Double diff. between Fr. Togo and Br. Togoland, $(\delta_2^{post} - \delta_2^{pre}) - (\delta_1^{post} - \delta_1^{pre})$, see Table 2.

^b Coefficient $(\beta_2^{post} - \beta_2^{pre}) - (\beta_1^{post} - \beta_1^{pre})$, in percentage points per year, see Table 3.

^c Dummies for each half degree of latitude, and for each 100 meters elevation above sea level (up to 300 meters), and dummies for quartiles of terrain ruggedness index (30-arc-seconds grid) from Nunn and Puga (2012).

^d Cities: Distance and squared distance to the closest city, taking cities with more than 30,000 inhabitants in 1990 (Africapolis): Atakpame, Ho, Kpalime, Lomé, Sokode, and Yendi. Railway: Distance and squared distance to Togo railway lines: For born before 1903, railway line as of 1913; if born after 1924, lines as of 1934; if born between 1903–1924, interpolated. Cocoa: Output and squared output of cocoa beans in 1927, 5 km radius around place of birth (only Gold Coast, French Togo not available).

^e Regression discontinuity design: distance to the British/French border, interacted with all the variables of the base model (area dummies, pre-post dummies, or birth year trends and their mutual interaction).

^f Same as e, except British/German border as of 1914.

^g Each geographical variable is interacted with pre-post dummies (top panel), or pre-post birth year trends (bottom panel).

Notes: Clustered standard errors, by place of birth (in parentheses). Cohort sizes reweighted assuming a 2 percent annual demographic growth over 1890–1930.

Source and Coverage: Gold Coast Regiment data. Recruits enlisted 1908–1955, born 1890–1930. Except noted below: Place of birth in Togoland area, 50 km or less from the border between TVT and Togo, and 6.3 to 9.3 degrees latitude. Column 2: 25 km or less from TVT/Togo border. Column 4: Includes Extreme South, i.e., below 6.3 latitude, and in particular the capital city of Togo, Lomé. Column 7: 50 km or less from British/German border (as of 1914), still 6.3 to 9.3 degrees of latitude.

Column 5 shows that distance to the Togo railway lines should not be a great concern: recruits from Togo are not significantly born closer to the railway, so that we can't think that literate and skilled individuals on the French side have been more often diverted away from the GCR, thanks to the alternative labor opportunities opened by the railway.

Column 6 finally considers the potential impact of cocoa production that expanded from Gold Coast to British Togo around Ho and Kpandu in the 1920s, before to reach the French side at the end of the 1930s; of course, only southern forest areas are suitable for cocoa. A large share of the Togo cocoa beans were crossing the border to be transported to Lomé by railway; besides, people from the French side could also cross the border to work in Togo plantations on a seasonal basis. We only have data for cocoa production in Togo as of 1927, so that proximity to cocoa plantations is underestimated for Togo recruits. Unsurprisingly, Togo recruits are found to be born in places that are closer to the major cocoa plantations: while an average of 137 tons of cocoa is produced (in 1927) within 5 kilometers of their place of birth, the same figure is only 7 tons (=137-130) for French Togo recruits. However, the DiD-T estimate shows that the latest recruits from Togo tended to be recruited from places which were relatively further away from cocoa plantations, when compared to their French counterparts. Two issues are involved here. First, recruits who were at school age in the 1920s-1940s, i.e., recruits born after 1924, could have benefited from the income effect induced by the rise of cocoa production. Hence, part of the educational advantage of post-1914 Togo recruits could stem from the development of cocoa in this area. However, according to the DiD-T, this advantage should decrease over time. Second, cocoa could also have modified the labor market in the Togo area, by diverting more farmers or unskilled laborers out of the GCR recruitment. To check for this, we considered the occupation at entry in the GCR, and estimated the DiD and DiD-T model with "unskilled occupation" as the dependent variable (not shown). No significant variation is found, meaning that there is no sign that farming or unskilled occupations were more and more absorbed out of the GCR, in the cocoa sector or in other segments of the labor market.

Finally, in column 5 of Appendix Table 2 thereafter, we provide DiD and DiD-T estimates controlling for the three "constructed geography" variables: cities, railway, and cocoa. Estimates are very little affected. Collinearity issues explains why we refrained from controlling for all our six geographical variables together; still, when doing so, the double-difference estimates for literacy in the South become even larger and remain very significant: respectively -29.2^{**} (s.e. = 12.8) for DiD, and a very high -10.64^{***} (s.e. = 2.52) for DiD-T.

Appendix 2: Selection into the Gold Coast Regiment (GCR)

GCR recruits were asked about their ethnicity, so that we can directly identify partitioned ethnicities in the data: One major group is the Ewe in the South, other include from North to South, the Moba (Bimoba), Anufo (Chakossi), Konkomba, Basare, and Kotokoli (Tem). Ewe are in particular the most Christianized ethnicity. We first applied our DiD and DiD-T estimators to the share of Ewe or of partitioned ethnic groups to check that the ethnic origin of GCR recruits is not a confounder (not shown). Then, in the two first columns of Appendix Table 3, we show that for literacy

our estimates are robust to restricting analysis to the subsamples of Ewe recruits or of partitioned ethnicities more generally. For Christian religion, the DiD estimate for Ewe collapses to an insignificant -3 pp. This is due to a kind of saturation effect: among recruits born before 1914, already 49 percent of Ewe recruits are Christian, and for those born after 1914 the proportion raises to 88 percent; the same figures hold for Ewe from both TVT and Togo.

As a second check for variations in recruitment, we then include year of enlistment fixed effects as an additional control. This way we account for the fact that the GCR could have recruited more or less literate individuals during some periods, whatever their geographical origin. DiD and DiD-T are reassuringly unaffected (column 3, Appendix Table 3). Our third check consists in dropping recruits having declared a skilled occupation, while still controlling for date of entry. This way we only compare recruits who entered the GCR the same year and who were originally working as farmers or in another unskilled/semiskilled occupation. We acknowledge that this strategy is not an unambiguous improvement, as it relies on the assumption of a constant correlation between literacy and skilled occupations (across time and space). Yet, our estimates pass this additional test (column 4, Appendix Table 3). The divergence in Christian religion even increases. In fact, whatever their area of origin (TVT or Togo), 88 percent of skilled recruits born after 1914 are Christian. Our interpretation is that GCR recruitment was biased towards skilled men or even skilled Christians, so that including them blurs our estimates of the divergence in religion. This blurring effect also holds for the Ewe-restricted mentioned estimates above, as when restricting to Ewe-unskilled the DiD estimate for divergence in religion recovers large magnitude, although on a small sample size (not shown).

We also use data of recruits to the French army regiment based in neighboring Dahomey (today's Benin). We select the volunteers originating from Togo for whom literacy and/or religion were recorded, and include them in estimations, while controlling separately for year of entry in each of the two regiments (columns 5–6, Appendix Table 3). That way we control for the possibility that literate Togolese could have preferred joining the French army rather than the British. Results again remain unchanged.

Finally, we considered selective migrations, aside to selective recruitment, as another potential confounding mechanism. Recall that we use place of birth, hence migration between school age and enlistment is not an issue. Yet, skilled parents from Togo might have migrated to the British side, before their child was born, to avoid French heavier direct taxes, or to have their children educated in TVT or Gold Coast. Some Togolese elites were clearly “anglophile,” like for instance Sylvanus Olympio, the first president of independent Togo, or militants of Ewe reunification.² The GCR files also provide occupation of the recruit's father; then we also excluded from estimation the few recruits having declared a skilled father, and again our estimates are robust (not shown).

² See in particular: Assima-Kaptcha, Marguerat, and Sebald 2011.

APPENDIX TABLE 3
ROBUSTNESS TO SELECTION
(southern areas)

	Partitioned Ethnicities ^c		Recruitment Conditions ^{d,e}		French Army Outside Option ^f	
	Ewe	Ewe and Others	Year of Entry	Unskilled		Unskilled
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Double-difference pre and post-1914 (DiD)^a</i>						
Literate (%)	-22.0** (8.9)	-30.9*** (9.3)	-17.9*** (5.8)	-20.2*** (5.3)	-16.0*** (5.7)	-19.8*** (5.4)
Christian (%)	-3.1 (17.3)	-12.8 (16.7)	-24.0 (16.0)	-50.7*** (17.8)	-24.8 (16.2)	-51.7*** (17.2)
<i>Double-difference in trends (DiD-T)^b</i>						
Literate (%)	-3.77** (1.71)	-3.86*** (1.41)	-3.22*** (1.19)	-3.46*** (1.18)	-2.54** (1.17)	-3.32*** (1.18)
Christian (%)	-3.02 (2.10)	-0.26 (3.16)	-0.40 (2.46)	-2.76 (3.19)	-0.52 (2.45)	-3.58 (3.11)
<i>N</i>	250	316	428	275	451	292
FE Yr. of entry GCR ^d	No	No	Yes	Yes	Yes	Yes
FE Yr. of entry Fr. army ^d	—	—	—	—	Yes	Yes

* $p < .10$.

** $p < .05$.

*** $p < .01$.

^a Double-diff. between Fr. Togo and Br. Togoland, $(\delta_2^{post} - \delta_2^{pre}) - (\delta_1^{post} - \delta_1^{pre})$, see Table 2.

^b Coefficient $(\beta_2^{post} - \beta_2^{pre}) - (\beta_1^{post} - \beta_1^{pre})$, in percentage points per year, see the text and Table 3.

^c Ewe: Subsample of recruits from Ewe ethnic group. Partitioned: Recruits from partitioned ethnic groups, i.e., ethnic groups for which significant numbers of recruits are found to be born on both sides. Partitioned ethnicities are, in the Southern area: Ewe, then mainly Basare and Buem, Avatime, Konkomba, and Kotokoli.

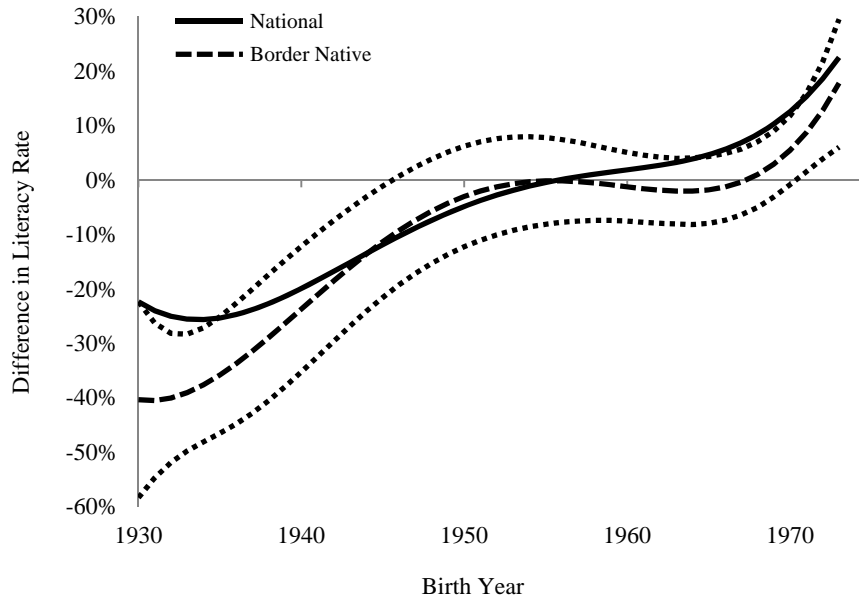
^d Year of entry into the GCR fixed effect. Columns 5–6: Year of entry into French army is a separate fixed effect.

^e Recruits having an unskilled occupation.

^f Including volunteers from Togo in the French military regiments located in Dahomey (present-day Benin).

Notes: Clustered standard errors, by place of birth (in parentheses). Cohort sizes reweighted assuming a 2 percent annual demographic growth over 1890–1930, see Table 2 and the text.

Source and Coverage: Gold Coast Regiment (GCR) data, and colonial French West Africa military data. (Cogneau and Moradi 2014) Place of birth in Togoland area, 50 km or less from the border between TVT and Togo, and 6.3 to 9.3 degrees latitude.



APPENDIX FIGURE 2
DIFFERENCES IN LITERACY IN THE SOUTHERN PART OF CÔTE D'IVOIRE/GHANA
BORDER

Notes: Difference in Literacy Rate between Côte d'Ivoire and Ghana, according to birth cohort. Solid line = National difference: Men born 1930–1974 in the country. Dash line = Border difference: Men born 1930–1974 in border districts. Lines are obtained using a quartic polynomial smoothing.

Southern border districts: In Côte d'Ivoire: Aboisso, Abengourou, Adzope, Agboville, Bongouanou; in Ghana: Western. Literacy: Capacity to read a newspaper. The literate dummy variable is regressed on a quartic of date of birth, for each country and each population (country natives or border natives).

Sources: Côte d'Ivoire Living Standard Surveys round 2 to 4 (1986–1989) and Ghana Living Standard Surveys rounds 1 and 2 (1987–1989).

Appendix 3: Côte d'Ivoire and Ghana

Appendix Figure 2 below illustrates the literacy advantage of the Gold Coast colony compared to its Western neighbor, the former French colony of Côte d'Ivoire. These results come out from an analysis of household surveys that were implemented at the end of the 1980s in the two countries.³ The early date and the large sample size of these surveys allow gathering unbiased representative samples of men born during the colonial era in the districts lying at the border of the two countries. In the southern part of the border, men born in the 1930s and the 1940s in Côte d'Ivoire are revealed to be significantly less literate than their Ghanaian neighbors, by 20 percentage points on average. No difference is observed in the northern part. The analysis of younger cohorts then reveals that Côte d'Ivoire managed to catch up with its neighbor at the turn of independence, i.e., for cohorts born around 1950.

³ See Cogneau, Mesplé-Somps, and Spielvogel forthcoming 2014.

REFERENCES

- Africapolis database. Available online at <http://www.e-geopolis.eu> (accessed October 2013)
- Assima-Kaptcha, Essoham, Yves Marguerat, and Peter Sebald. "L'éducation sous domination coloniale." In *Histoire des Togolais -Des origines aux années 1960; tome 4: Le refus de l'ordre colonial*, edited by Nicoué Gayibor, 101–59. Lomé: Karthala, 2011.
- Cogneau, Denis, Sandrine Mesplé-Somps, and Gilles Spielvogel. "Development at the Border: Policies and National Integration in Côte d'Ivoire and Its Neighbors." *World Bank Economic Review*, forthcoming.
- Cogneau, Denis, and Alexander Moradi. "Men Under Arms in Colonial Africa: Tirailleurs Senegalais, 1880–1960." Mimeo, Paris School of Economics and University of Sussex, 2014.
- Ghana. *Ghana Living Standard Surveys*. Available online at <http://www.worldbank.org/lsms/>.
- Macro International. *Demographic and Health Surveys*. Available online at <http://www.measuredhs.com>.
- Moradi, Alexander. "Men Under Arms in Colonial Africa: Gold Coast Regiment." Mimeo, University of Sussex, 2008.
- Nunn, Nathan, and Diego Puga. "Ruggedness: The Blessing of Bad Geography in Africa." *The Review of Economics and Statistics* 94, no. 1 (2012): 20–36.