The Long-run Effects of Africa's Wave of Democratization

Idris Kambala *

Abstract

Africa's wave of democratization in the early 1990s transformed the continent's political landscape, yet whether it delivered sustained economic and developmental gains remains an open question. This paper provides the first comprehensive evidence on the long-run effects of Africa's democratization across national, subnational, and individual-level analyses. At the national level, I find that a transition from nondemocracy to democracy is associated with 1.2 percent higher income per capita, while a full-range increase in the liberal democracy index from 0 to 1 corresponds to a 13 percent increase in income per capita. These income gains operate through improvements in physical capital accumulation, trade openness, human capital formation, and economic liberalization. To strengthen causal identification, I exploit Africa's colonial borders, which arbitrarily divided ethnically homogeneous communities into present-day consolidated democracies and nondemocracies. This identification strategy allows me to examine the impact of democratization on subnational development and on individual living conditions. Grid cell-level panel fixed effects estimates show that democratization significantly raises subnational development as proxied by nighttime light density. Employing a within-ethnicity geographic regression discontinuity design, I track development disparities from 1992 to 2013. The main results show that while both sides of the border started at comparable development levels in the early 1990s, democratic partitions experienced sustained gains thereafter, becoming 7 percentage points (pp) more likely to have light at night by 2013, representing a 37 percent increase relative to the sample mean. Individual-level survey evidence further shows that residents of democratic partitions report substantially lower economic insecurity, higher educational attainment, greater waged employment, and significantly better access to public infrastructure.

Keywords: Democratization, Economic Development, Africa, Ethnic Partitions

JEL Classification: O10, O43, O55, D72

*Department of Economics, University of South Carolina, iddrisu.kambala@grad.moore.sc.edu. www.iddrisukambala.com. I am grateful to Douglas Woodward, Crystal Zhan, Lindsey Woodworth, Andres Marroquin, and James Fenske for their useful comments and suggestions. I also thank conference participants at the 2024 Economic Development in Africa Conference, Center for the Study of African Economies, University of Oxford, and the 94^{th} Annual Meeting of the Southern Economic Association, Washington DC. All errors and omissions are mine.

I. Introduction

In the early 1990s, Africa underwent one of the most sweeping political transformations of the twentieth century. In less than a decade, the number of African democracies rose from four to nineteen, and by 1997, forty-four of forty-eight countries had held some form of competitive, multiparty elections, upending the military regimes, autocracies, and one-party states that had dominated the continent since independence (Bratton and Van de Walle, 1997; Ndulu and O'Connell, 1999; Goldsmith, 2001). This wave of democratization brought with it enormous hope that accountable governments would reduce corruption, expand public services, and deliver the sustained economic growth that authoritarian rule had so persistently failed to produce (Bates, 2006; Collier et al., 2007; Sandbrook, 1996; Van de Walle, 1999).

Three decades on, however, the central question this transformation raises remains surprisingly unresolved. Did Africa's democratization wave actually improve the economic and developmental prospects of the region? Despite a large body of research on democracy and development, credible evidence on this question for Africa specifically is limited, methodologically fragile, and, by some recent accounts, actively contested (Khodaverdian, 2021).

This paper provides the first comprehensive causal investigation of that question. Providing such an investigation is not straightforward. The difficulty stems from a set of serious empirical challenges that have plagued the broader democracy-development literature for decades. Standard approaches that correlate democratic status with economic outcomes cannot rule out reverse causality. For instance, countries that are wealthier or growing faster may simply be more likely to democratize, rather than the other way around (Barro, 1999; Lipset, 1959). In addition, time-varying factors that simultaneously affect political transitions and economic performance could complicate the picture. Africa's democratization wave, for instance, coincided with Structural Adjustment Programs and significant changes in foreign aid, making it difficult to attribute observed economic changes to democratization alone.

Perhaps most importantly, most existing studies focus exclusively on national income, and therefore miss an entire dimension of what democratization might deliver, since improvements in local development, human capital, and individual wellbeing may never fully show up in aggregate GDP figures (Fetzer et al., 2016; Kudamatsu, 2012). The result is a literature that cannot credibly establish whether democratization caused the observed economic changes, and that has largely ignored the subnational and individual-level dimensions where democracy's most meaningful impacts may lie.

This paper addresses both limitations. To identify the causal effect of democratization, I exploit a natural experiment embedded in Africa's own colonial history. When European powers partitioned the continent in the late nineteenth century, they drew borders with little regard for the ethnic communities already living there, splitting hundreds of culturally

and linguistically homogeneous groups across what would become separate nation-states (Michalopoulos and Papaioannou, 2016). By a stroke of historical contingency, some of these partitioned groups find themselves today divided between consolidated democracies and nondemocracies. Because members of the same ethnic group share common ancestry, language, history, and geography, any systematic differences in development that emerge across their shared border can be plausibly attributed to the political regime on each side. This within-ethnicity comparison provides a credible answer to the endogeneity concerns that have long undermined causal inference in this literature. Crucially, this setting also allows me to move beyond national income and examine how democratization shaped development at the subnational level and in the lived conditions of ordinary people.

To implement this strategy, I construct a panel of 10 km by 10 km grid cells spanning the border regions where democratic and nondemocratic ethnic partitions meet. For each cell, I extract annual nighttime light intensity data from 1992 to 2013, a satellite-based measure that has become a standard and reliable proxy for subnational economic activity in settings where official income statistics are sparse or politically manipulated (Henderson et al., 2012; Martinez, 2022). I complement the aggregate analysis with individual-level survey data, covering respondents from partitioned ethnic groups, to assess whether the development advantages of democratic governance extend to individual socioeconomic outcomes and living conditions.

With this framework in place, the empirical analysis proceeds in four steps, beginning at the national level before moving to the subnational border analysis. I first use a dynamic panel fixed effects model to estimate the relationship between democratization and GDP per capita across all sub-Saharan African countries from 1990 to 2018. I then move to the subnational level, where I first estimate grid cell panel fixed effects regressions within partitioned ethnic homelands, and then implement a geographic regression discontinuity design that compares development outcomes across regime-dividing borders over time. Finally, I use individual-level survey data to assess disparities in economic security, education, employment, and access to public goods between residents of democratic and nondemocratic partitions. As a final check on the causal interpretation of the findings, I conduct a focused case study of the Ghana-Togo border and a falsification test using a placebo border.

For the national-level analysis, I measure democratization using two complementary indicators. The first is a dichotomous measure that classifies a country as democratic if it satisfies joint criteria from Polity5 and Freedom House. The second is the liberal democracy (libdem) index from V-Dem, a continuous measure that captures not just electoral competition but also the rule of law, executive constraints, and civil liberties. To address the well-documented GDP dip that typically precedes democratization, a feature of the data that would otherwise bias standard panel estimates downward, I use a dynamic panel specification that includes lagged income as a control (Acemoglu et al., 2019).

The national-level analysis shows that being in a democratic regime as opposed to a nondemocratic one is associated with a 1.2 percent increase in income per capita. A full improvement in the liberal democracy index from 0 to 1 corresponds to a 13 percent income gain. These estimates are robust to standard controls, region-specific time trends, and to accounting for the Structural Adjustment Programs that swept the continent during the same period. I further show that democratization improved the key drivers of income growth, including physical capital accumulation, trade openness, human capital, and economic liberalization, providing a set of plausible channels through which the aggregate income effect operates.

Moving to the subnational level, I assign each grid cell the annual democracy score of the country in which it is located, using the same dichotomous and continuous measures as before. This allows me to estimate the average relationship between democratization and local development across all partitioned ethnic homelands, controlling for time-invariant characteristics at the grid cell level and common year-specific shocks. The results echo the national-level findings with striking consistency. A full-range increase in the liberal democracy index raises the probability that a grid cell has light at night by 16 percentage points (pp). Being under a democratic regime as opposed to a nondemocratic one increases this probability by 3.5 pp. These effects hold across multiple transformations of the nighttime light data and across both narrow and wider neighborhoods of partitioned ethnic homelands.

The regression discontinuity estimates tell the same story with greater precision. Democratic and nondemocratic partitions were at virtually identical development levels in the early 1990s, providing a clean pre-treatment baseline. From the mid-1990s onward, nighttime light intensity began rising faster on the democratic side, and the gap widened steadily and persistently over time. By 2013, a grid cell in a democratic partition was about 7 pp more likely to have light at night than its nondemocratic counterpart, representing a 37 percent increase relative to the sample mean. These results are robust to a wide range of sensitivity checks, including alternative light measures, geographic covariates, population controls, two-dimensional RD specifications, ethnicity-specific slopes, and data-driven bandwidth selection.

I complement the aggregate analysis with individual-level survey data, covering respondents from partitioned ethnic groups, to assess whether the development advantages of democratic governance extend to personal economic security, educational attainment, employment, and access to public goods. The individual-level evidence reinforces these aggregate patterns. People living on the democratic side of the border report substantially better outcomes across every dimension measured. Economic insecurity is 23.5 points lower on a 0 to 100 scale, subjective wellbeing is higher, secondary school completion is more common, waged employment is more likely, and access to electricity, paved roads, and sewage systems is

considerably greater.

A focused case study of the Ghana-Togo border deepens these findings further. Cohorts born after Ghana's democratic transition in 1992 completed roughly one additional year of schooling and were 7 pp more likely to have received any formal education compared to their counterparts on the Togolese side. No such gap exists among cohorts born before the transition, which largely rules out the possibility that pre-existing structural differences between the two sides are driving the results. Lastly, a falsification test using a placebo border that no longer divides any democratic and nondemocratic pair finds no development discontinuities, providing a final check on the causal interpretation. Taken together, these findings point to a consistent and striking conclusion: Africa's democratization wave generated substantial and lasting gains not just in national income but in the lived conditions of ordinary people.

This study makes two broad contributions. First, it offers the first comprehensive causal investigation of the economic and developmental consequences of Africa's 1990s democratization wave. While existing work has documented a positive association between democracy and income in Africa (Bates et al., 2012; Fosu, 2008; Lewis, 2008; Tiruneh, 2006; Nkurunziza and Bates, 2003; Masaki and van de Walle, 2015), these studies rely on approaches that cannot convincingly address endogeneity, focus exclusively on national income, and predate or only partially cover the democratization wave itself. To that end, this paper advances the literature on three fronts. First, it provides more credible causal identification than any prior Africa-focused study. Second, it is the first to assess the subnational and individual-level consequences of the democratization wave. Third, it documents that the gains from democracy in Africa are not confined to national income aggregates but extend to the lived conditions of ordinary people.

Second, the paper contributes to the broader democracy-development literature by demonstrating that Africa's colonial borders can serve as a powerful and underutilized natural experiment for studying the long-run effects of political institutions (Michalopoulos and Papaioannou, 2014). Unlike the global panel approaches that dominate this literature (Acemoglu et al., 2019; Papaioannou and Siourounis, 2008), the within-ethnicity border design exploits variation that is plausibly exogenous to the economic outcomes it seeks to explain, and in doing so, provides among the most credible causal estimates of democracy's developmental effects produced to date.

The remainder of the paper is organized as follows. Section II. reviews the related literature. Section III. presents the national-level analysis of democratization and income per capita using a dynamic panel fixed effects model. Section IV. introduces the border analysis, describing the identification strategy, the data, and the estimation framework. Section V. presents the empirical results from the border analysis, including the panel fixed effects estimates, the regression discontinuity results, and the individual-level findings. Section

VI. concludes. A case study of the Ghana-Togo border and a falsification analysis using a placebo border are presented in Appendix B.

II. Related Literature

This study sits at the intersection of three bodies of work. These are the literature on democracy and economic development in Africa, the literature linking democratic governance to human development outcomes, and the literature on Africa's colonial borders as natural experiments for studying institutional effects. Each strand informs a different dimension of the analysis, and together they point toward the same unresolved question as to whether Africa's wave of democratization actually transformed the economic and developmental prospects of the region.

A substantial body of research examines the relationship between democracy and economic growth in Africa, and the broad consensus leans positive, though the evidence is far from settled. Early contributions by Feng (1996), Fosu (2008), and Tiruneh (2006) find positive associations but rely on time-aggregated data that obscure year-to-year variation and cannot support causal claims. Studies using annual panel data, such as Bates et al. (2012), Carbone et al. (2016), and Knutsen (2013), improve on this but often fail to account for both country and time fixed effects, limiting their ability to isolate the within-country effect of regime change. More descriptive accounts, including Lewis (2008) and Van de Walle (1999), document the correlation between democratic governance and income without attempting causal identification.

A more methodologically rigorous exception is Nkurunziza and Bates (2003), who use system GMM estimation and find a significant positive effect of democracy on growth. However, their analysis covers 1960 to 1990, a period that predates Africa's major democratization wave, and relies on five-year aggregated data that may miss important short-run dynamics. More recently, Khodaverdian (2021) find that unlike in other world regions, democracy in sub-Saharan Africa does not significantly raise GDP per capita, attributing this in part to the failure of democracy to reduce child mortality and thus curb rapid population growth. Taken together, this literature is both methodologically fragile and substantively inconclusive, leaving the core question of whether Africa's democratization wave delivered economic gains without a credible answer.

Two studies come closest to addressing this gap directly. De Kadt and Wittels (2019) apply the synthetic control method to evaluate the economic effects of Africa's democratization wave and report mixed results, with positive impacts in some countries and negative in others. Masaki and van de Walle (2015) examine both the level and duration of democracy, showing that economic benefits are more pronounced in countries with longer democratic histories. Both contributions are valuable, but neither accounts for the well-documented GDP dip that precedes democratization episodes, a failure that likely biases their estimates

downward. In addition, neither study examines subnational or individual-level outcomes. The current paper addresses both of these limitations directly.

Beyond the aggregate income question, a related body of work examines how Africa's 1990s democratization wave shaped specific policy outcomes. Bates (2006) combines principal-agent theory with empirical evidence to argue that while democratization curtailed opportunistic political behavior, it also generated political instability and failed to consistently deliver sound macroeconomic policy. Kudamatsu (2012) uses household-level data to show that the democratization wave significantly reduced infant mortality across the continent. Fetzer et al. (2016) document that democratization led to more balanced urbanization, with non-capital cities catching up to capital cities in economic activity. These studies establish that the 1990s wave had meaningful effects beyond national income, but they focus on narrow outcomes and do not provide a unified assessment of democratization's long-run developmental impact. The current paper fills this gap by systematically examining a broad set of economic and development outcomes, from national income to subnational nighttime lights to individual-level socioeconomic conditions.

At the micro level, a growing literature connects democratic governance to improvements in human development. Harding and Stasavage (2014) show that African democracies are more likely to abolish school fees, increasing access to primary education, while Stasavage (2005) documents that democratic governments in Africa spend more on education. More recently, Harding (2020) finds that democratic elections significantly increase access to primary education and reduce infant mortality, but primarily in rural areas, where governments face stronger electoral incentives to deliver services. These findings align with the broader theoretical argument that democratic accountability compels governments to invest in public goods and human capital (Deacon, 2009; Schiel et al., 2023). Beyond education and public goods, democratic accountability also shapes citizens' subjective experience of governance. Dorn et al. (2007) find that higher self-reported wellbeing in democratic societies stems from greater citizen participation and better alignment between policy and public preferences, suggesting that the benefits of democracy extend beyond measurable outputs to the quality of life people perceive. My study builds on this literature by providing the first causal evidence that democratization improves a comprehensive set of individual-level outcomes, including economic security, educational attainment, employment, access to infrastructure, and subjective wellbeing, using a within-ethnicity comparison that controls for the cultural and historical confounders that plague cross-country analyses.

The identification strategy in this paper draws directly on the literature examining Africa's colonial borders as natural experiments. European colonial powers drew Africa's borders in the late nineteenth century with little regard for the ethnic communities already living there, splitting hundreds of ethnic groups across what became different nation-states (Asiwaju, 1985). This process of ethnic partitioning has been extensively studied. Michalopoulos and

Papaioannou (2016) show that regions split by colonial borders suffer from higher conflict and persistent economic disparities, while Englebert et al. (2002) document increased political instability and secessionist pressures in partitioned areas. Most relevant to this paper, Michalopoulos and Papaioannou (2014) exploit these border designs to show that national institutions shape subnational development, finding that differences in institutional quality across borders translate into differences in nighttime light density. Dimico (2017) use similar designs to study how ethnic group size affects economic outcomes. The current paper is the first to exploit Africa's partitioned ethnic groups specifically to study the developmental consequences of democratization, extending this literature in a direction that prior work has not pursued.

A related strand of this literature concerns the reach of state authority in Africa. Several scholars argue that African states lack the capacity to extend governance beyond capital cities and major urban centers, implying that regime type may have limited influence on development in peripheral border regions (Forrest, 1988; Herbst, 2000). Consistent with this view, Michalopoulos and Papaioannou (2014) find that national institutions have limited developmental impact in border areas beyond capitals. My findings challenge this conclusion in an important way. Border areas in democratic partitions show significantly higher development than their counterparts in nondemocratic partitions, suggesting that consolidated democratic governance is associated with stronger state penetration, even in Africa's most peripheral regions. This result implies that the developmental benefits of democracy are not confined to urban centers but extend to the communities that standard analyses most often miss.

Finally, this study speaks to an urgent contemporary debate about the trajectory of democracy in Africa. After decades of gradual democratic consolidation following the 1990s wave, the continent has experienced a sharp reversal. Between 2020 and 2023 alone, there were 16 coup attempts in Africa, of which 9 were successful, concentrated heavily in the Francophone Sahel (Powell and Thyne, 2011; Wilén, 2024). Despite this backsliding, public support for democracy remains strong across the continent (Gyimah-Boadi, 2015; Mattes, 2019), with Afrobarometer's Round 8 survey showing that approximately seven in ten Africans prefer democracy over other forms of government. Strikingly, the recent wave of coups has occurred almost exclusively in Africa's weakest and most fragile democracies rather than in its consolidated ones. The findings of this paper offer a potential explanation for this pattern. Where democratization has been sustained and has delivered tangible development gains, as in Ghana, Botswana, and Namibia, democratic institutions appear more resilient. The evidence presented here thus carries direct implications not only for the academic literature on democracy and development but for the ongoing policy debate about how to reverse Africa's democratic backsliding.

Overall, the literature points to a common blind spot. Existing work on democracy and

African development lacks credible causal identification, existing work on human development lacks the subnational and individual-level granularity needed to capture democracy's full impact, and existing work on Africa's colonial borders has not been applied to the question of democratization. This paper addresses all three gaps simultaneously.

III. Democratization and Economic Performance in Africa

Africa's democratization wave of the early 1990s was part of the broader global "third wave" of democratization that swept through much of the developing world following the end of the Cold War (Bratton and Van de Walle, 1997; Huntington, 1991). In Africa, however, the wave had a distinct character, driven by a confluence of internal and external pressures. Domestically, the economic crises of the 1980s had severely eroded the legitimacy of authoritarian regimes, which had failed to deliver on their promises of development and stability (Bates, 2010; Ndulu and O'Connell, 1999). Popular protests, labor strikes, and demands for multiparty politics mounted across the continent. Externally, the end of Cold War geopolitics reduced Western tolerance for authoritarian allies. International donors began attaching political conditionality to development assistance, requiring competitive elections and respect for civil liberties as prerequisites for continued aid (Goldsmith, 2001; Van de Walle, 1999).

Together, these pressures produced a remarkable political transformation. As Figures 1a and 1b illustrate, the number of African democracies rose sharply in the early 1990s and democratic quality, measured by the liberal democracy (libdem) index, political rights, and civil liberties, improved substantially across the continent over this period. By the mid-1990s, the political landscape of sub-Saharan Africa had been fundamentally altered. The question that motivates this section is whether that political transformation translated into measurable economic gains.

To examine this question, I analyze a sample covering all contemporary sub-Saharan African countries from 1990 to 2018.[1] The starting year of 1990 is chosen to capture the post-democratization trends that define the period of interest. The endpoint of 2018 reflects the coverage of the Polity5 dataset, a key source of democratic indicators used in this study. All economic data are drawn from the World Development Indicators.

III.I Empirical Framework

I estimate the impact of democratization on GDP per capita, measured in constant 2015 US dollars, using a dynamic panel fixed effects model. The specification takes the following

[1] Only South Sudan is excluded since it gained independence in 2011.

form:

$$y_{ct} = \sum_{j=1}^{q} \beta_j y_{ct-j} + \alpha Democ_{ct} + \gamma_t + \delta_c + \varepsilon_{ct} \tag{1}$$

Here, y_{ct} is the natural logarithm of GDP per capita for country c in year t. The lagged values of the dependent variable on the right-hand side serve two purposes. First, they capture persistence and convergence dynamics in income, allowing the model to account for the fact that income in one period is strongly determined by income in prior periods. Second, and more importantly for identification, they absorb the economic downturns that typically precede democratization. As Figure 2 shows, GDP per capita in sub-Saharan Africa declined in the years immediately before the 1990s wave and only began recovering in the mid-1990s. Failing to account for this pre-democratization dip would cause standard panel estimates to understate the positive effect of democracy on income (Acemoglu et al., 2019). Because the sample begins in 1990, I include five lags ($q = 5$) to fully absorb the early-1990s downturn.

The term $Democ_{ct}$ captures a country's democratic status in year t. I use two complementary measures, one continuous and one dichotomous, to ensure that the results are not sensitive to how democracy is operationalized. Continuous measures capture the full range of democratic quality but risk conflating democracy with its policy outcomes. Categorical measures reduce this risk but depend heavily on procedural criteria such as executive selection and may miss important gradations within regime types. Using both measures allows me to assess whether the income effects of democratization are robust to these measurement choices.

The continuous measure is the libdem index from V-Dem, which ranges from 0 to 1 and integrates multiple dimensions of democratic governance. Beyond electoral competition, it also captures the rule of law, checks on executive power, and the protection of individual and minority rights (Coppedge et al., 2016). The index assigns greatest weight to countries that perform strongly on both its electoral and liberal dimensions simultaneously, meaning that countries which hold competitive elections but lack meaningful constraints on executive power score considerably lower than fully consolidated democracies. This property makes it particularly well suited to the African context, where many countries transitioned to multiparty elections without developing the deeper institutional foundations of liberal democracy.

Figure 3 shows the average libdem scores across sub-Saharan African countries over the sample period. The regional average is low at 0.27, with considerable cross-country variation. However, the libdem index has a measurable direct association with income. Figure 4 confirms this strong positive association between the libdem index and GDP per capita.

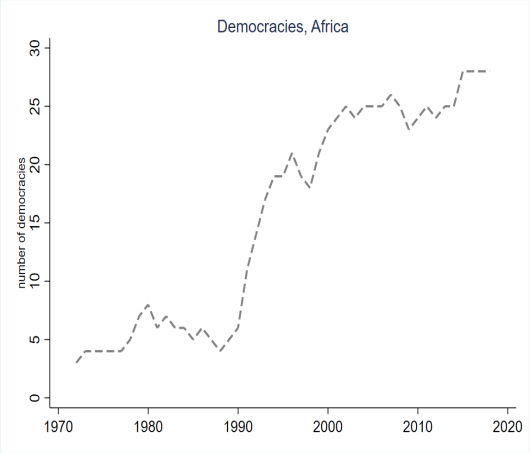
The dichotomous measure follows Acemoglu et al. (2019) and classifies a country as a democracy in a given year if it satisfies two joint conditions. First, its $Polity2$ score must exceed

zero, placing it above the midpoint of the autocracy-to-democracy spectrum. Second, Freedom House must classify it as either free or partly free. This dual-criteria approach reduces the risk of misclassifying pseudo-democracies that hold elections without meaningful political competition.

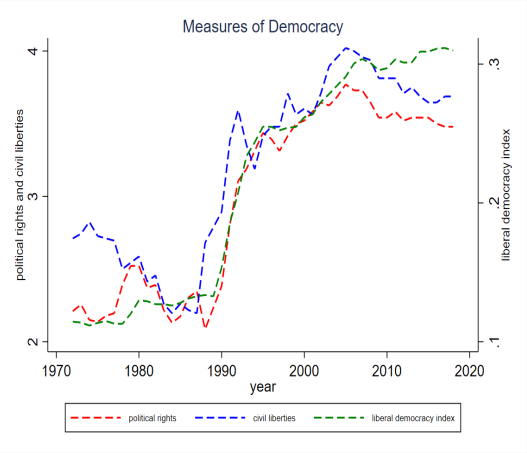
Based on this measure, thirteen countries in the sample were never classified as democracies during the 1990 to 2018 period, four were consistently democratic throughout, and thirty-one transitioned between regimes at least once. Figure 5 illustrates these patterns. In a fixed effects framework, only countries that experienced regime changes contribute to identification under binary coding, so the estimates would capture within-country variation in democratic status rather than cross-sectional differences between persistently democratic and persistently nondemocratic states.

The model includes year fixed effects, γ_t, to absorb common shocks affecting all countries simultaneously, such as global commodity price cycles or international financial crises. Country fixed effects, δ_c, absorb time-invariant characteristics including geography, colonial history, and culture. Both sets of fixed effects are essential in this context, where Africa's diverse colonial histories and shared exposure to global economic cycles could otherwise confound the estimated effect of regime change. I also estimate versions of the model that add region-by-year interactions to control for differential regional dynamics, such as the distinct economic trajectories of West, East, Central, and Southern Africa over this period.

One technical concern with dynamic panel models of this form is the Nickell bias, which arises because lagged dependent variables are correlated with the fixed effects through the error term (Kiviet, 1995; Nickell, 1981). However, this bias diminishes as the number of time periods T grows. Simulations by Judson and Owen (1999) show that when T approaches 30, standard fixed effects estimators perform comparably to GMM alternatives specifically designed to address this bias. With $T = 29$ in this study, the Nickell bias is minimal and the fixed effects approach is appropriate.



(a) Democracies in Africa



(b) Liberal Democracy, Political Rights, and Civil Liberties

Figure 1: The figures display Africa's democratization trend from 1972 to 2018. The left panel shows the number of democracies defined as countries with a Polity2 score greater than zero and classified as free or partly free by Freedom House, while the right panel shows yearly performance in the liberal democracy index from V-Dem alongside civil liberties and political rights from Freedom House.

III.II Estimates

Table 1 presents the estimated impacts of democratization on income per capita. Columns (1) to (3) use the libdem index while columns (4) to (6) use the dichotomous indicator. In columns (1) and (4), the only regressors beyond the lagged dependent variables are the democracy measures themselves. Columns (2) and (5) add controls for trade openness, government consumption, household consumption, and gross fixed capital formation, all entered as natural logs of their shares of GDP. Because these controls have substantial missing data that would reduce the sample considerably, columns (1) and (4) are the preferred specifications. Columns (3) and (6) further add region-by-year interactions to absorb differential regional shocks and trends.

The results show that democratization has a positive impact on income. A full-range increase in the liberal democracy index from 0 to 1 corresponds to a 13 percent rise in income per person, whereas being in a democratic regime as opposed to a nondemocratic one is associated with a 1.2 percent increase in GDP per capita. Adding controls in columns (2) and (5) does not substantially alter these estimates, and the region-by-year interactions in columns (3) and (6) leave the main findings essentially unchanged, confirming that the results are not driven by differential regional trends.

To appreciate the economic significance of these effects, consider a country at the sample's average GDP per capita of $2,014. A transition from nondemocracy to democracy is associated with an income gain of roughly $24 per person. A full improvement in the liberal democracy index translates to a gain of approximately $270 per person. While these figures

are approximations, their cumulative impact becomes substantial when multiplied across national populations and compounded over the three decades of the sample period.

III.III Discussion

The results establish a robust positive relationship between democratization and income. The more interesting question is through which channels this relationship operates, and whether the observed income gains might be partly attributable to the Structural Adjustment Programs that coincided with the democratization wave rather than to democratization itself.

On the mechanisms side, the theoretical case for a democracy-growth link rests on several complementary arguments. Democratic accountability disciplines political leaders through competitive elections, reducing rent-seeking and creating incentives for sound economic policymaking (Adam et al., 2011). Furthermore, governments that deliver good economic performance are electorally rewarded, encouraging investment in public goods and services that raise the stock of both physical and human capital. Democratic governance also tends to promote economic liberalization (Rode and Gwartney, 2012), which has itself been shown to be a significant driver of economic growth (Aixalá and Fabro, 2009; Billmeier and Nannicini, 2013; Doucouliagos and Ulubasoglu, 2006). Finally, by reducing the risk of sudden unconstitutional transfers of power, democracy lowers the political risk premium that deters foreign investment, a channel that is particularly relevant in sub-Saharan Africa, where the threat of military coups and violent regime change has historically been concentrated in nondemocratic states.

I examine these channels empirically by testing the relationship between the democracy measures and five key income determinants, namely trade openness, physical capital, human capital, foreign direct investment, and economic liberalization. Physical capital is proxied by gross fixed capital formation, foreign capital inflows by net FDI, and human capital by primary school enrollment. Economic liberalization is measured using the Economic Freedom of the World (EFW) index from the Fraser Institute, a comprehensive measure constructed from 45 data points spanning government size, legal institutions, monetary stability, trade freedom, and regulation, with each dimension scored on a 0 to 10 scale (Gwartney et al., 2023). Because the EFW index is available annually only from 2000 onward, with five-year intervals before that, the mechanism analysis covers 2000 to 2018 and excludes Equatorial Guinea, Eritrea, and São Tomé and Príncipe due to data unavailability.

The results, reported in Table 2, show that democratization positively affects most of the income drivers examined. The libdem index is associated with significant increases in trade openness, physical capital accumulation, and economic liberalization. The dichotomous democracy indicator shows positive effects on openness, physical capital, and human capital, though its association with FDI inflows and economic liberalization is not statistically

significant. This contrast between the two measures is analytically informative. The finding that the libdem index predicts economic liberalization more strongly than the binary indicator suggests that it is the deeper institutional features of democracy, particularly the rule of law and judicial independence, rather than electoral competition alone, that drive the liberalization channel. Countries that held multiparty elections without strengthening these institutional foundations did not achieve the same liberalization gains as those that consolidated more fully.

Turning to the second concern, if Structural Adjustment Programs (SAPs) rather than democratization were the primary driver of Africa's income gains during this period, then controlling for economic liberalization should substantially reduce or eliminate the democratization coefficient. Panel B of Table 1 addresses this directly by incorporating the EFW index as an additional control, re-estimated with an AR(1) specification given the shorter time coverage of the EFW data. The results show that economic liberalization is itself positively and significantly associated with income, with a one-point increase in the EFW index corresponding to a 1.8 to 2 percent rise in GDP per capita. Crucially, the democratization coefficients remain positive and statistically significant after this control is included, indicating that the income effect of democracy operates through channels beyond SAP-driven reforms. Some caution is warranted nonetheless. The EFW index does not capture all dimensions of SAPs, particularly fiscal austerity and debt restructuring, and some of its components, such as rule of law and property rights, may themselves be influenced by democratization, making full separation of the two effects difficult.

In sum, the national-level evidence establishes that Africa's democratization wave had a positive and meaningful impact on income per capita, operating through improvements in physical capital, trade openness, human capital, and economic liberalization. These aggregate results, however, can only go so far. National income averages mask wide variation in how development gains were distributed across space and across individuals. They also cannot rule out the possibility that unobserved time-varying factors are driving the observed associations rather than democratization itself. The next section addresses both of these limitations by turning to a subnational analysis that exploits the natural experiment created by Africa's colonial borders.

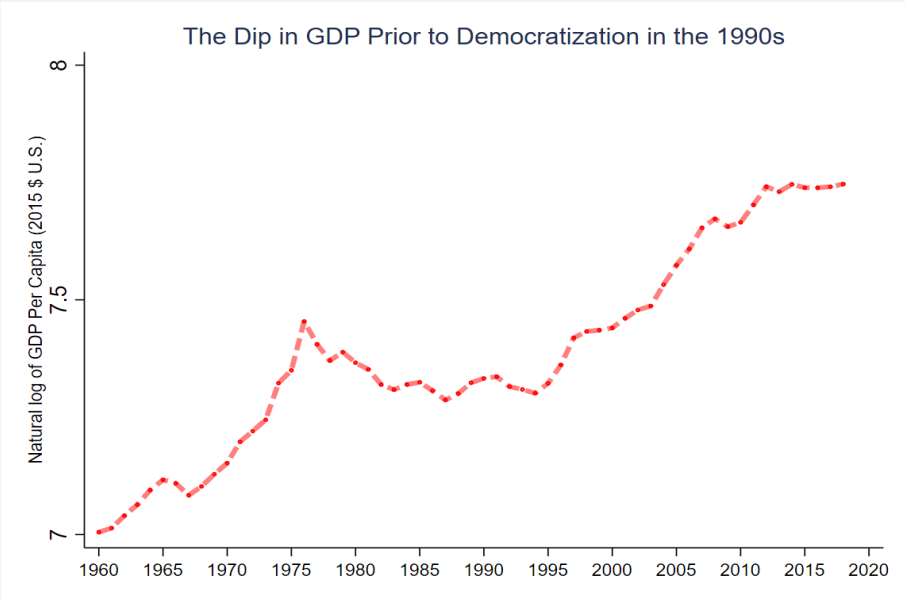


Figure 2: The figure shows the dip in GDP per capita prior to Africa's democratization in the early 1990s. Natural log of GDP per capita is in 2015 US dollars and data are from the World Development Indicators.

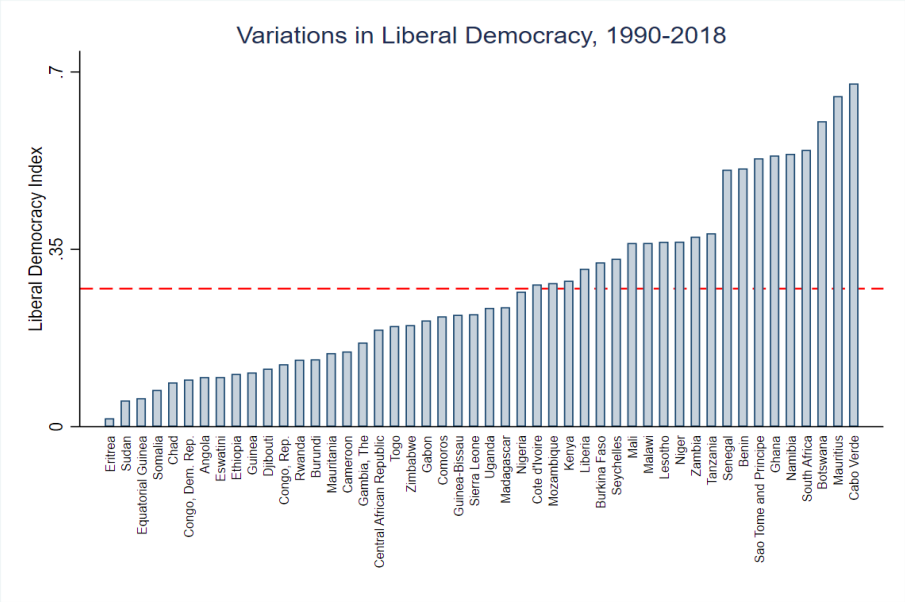


Figure 3: The figure shows countries' liberal democracy scores (libdem index) averaged between 1990 and 2018.

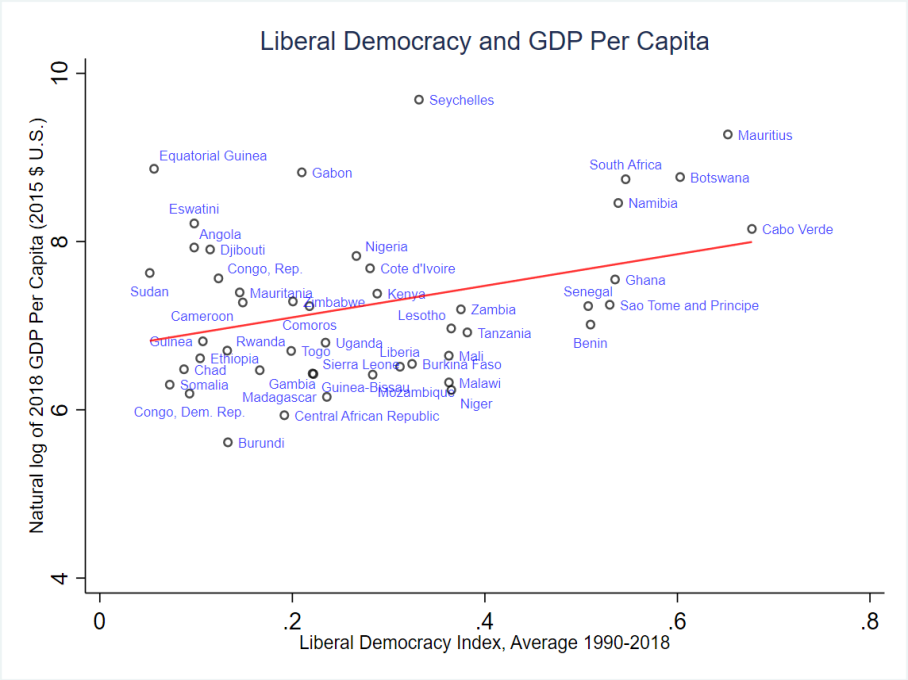


Figure 4: The figure shows the correlation between the liberal democracy index averaged between 1990 and 2018 and the natural log of GDP per capita in 2015 US dollars in 2018.

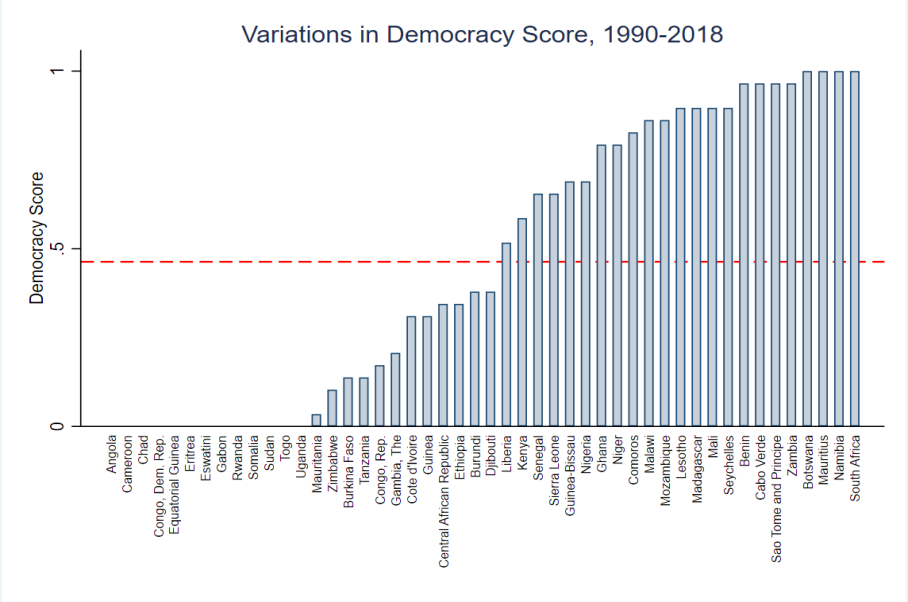


Figure 5: The figure shows countries' democracy scores averaged between 1990 and 2018.

Table 1: Democracy and Income

	(1)	(2)	(3)	(4)	(5)	(6)
Liberal Democracy	0.126***	0.131***	0.126***			
	(0.030)	(0.033)	(0.033)			
Democracy (1/0)				0.012**	0.020***	0.018**
				(0.006)	(0.007)	(0.007)
Observations	1,074	835	835	1,074	835	835
Within R-sq.	0.92	0.88	0.88	0.92	0.88	0.88
Controls	NO	YES	YES	NO	YES	YES
Region x Year	NO	NO	YES	NO	NO	YES
	Panel B. Accounting for the Effects of Economic Liberation					
Liberal Democracy	0.164***	0.151***	0.117**			
	(0.046)	(0.045)	(0.045)			
Democracy (1/0)				0.031***	0.024***	0.016**
				(0.006)	(0.007)	(0.007)
Economic Liberalization	0.018***	0.020***	0.019**	0.021***	0.022***	0.020**
	(0.007)	(0.008)	(0.008)	(0.007)	(0.008)	(0.008)
Observations	667	563	563	667	563	563
Within R-sq.	0.83	0.81	0.80	0.83	0.81	0.80
Controls	NO	YES	YES	NO	YES	YES
Region x Year	NO	NO	YES	NO	NO	YES

The table displays the estimates of the impact of democratization on income. Income is proxied by the natural log of GDP per capita expressed in 2015 dollars. Columns (1)–(3) use the liberal democracy (libdem) index as proxy for democracy while the remaining columns use a dichotomous indicator of democracy. All models include country fixed effects and year fixed effects. The models in Panel A include up to five lags of the dependent variable and those in Panel B have only one lag of the dependent variable. The controls are gross fixed capital formation, openness, government consumption, and household consumption. Columns (3) and (6) add four sub-regional x year interactions. Heteroskedasticity-robust standard errors reported in parenthesis below estimates. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 2: Democracy and Determinants of Income

	(1) Physical Capital	(2) Openness	(3) Net FDI	(4) Human Capital	(5) Economic Liberalization	(6) Physical Capital	(7) Openness	(8) Net FDI	(9) Human Capital	(10) Economic Liberalization
Liberal Democracy	0.533**	0.545***	1.329*	0.086	0.861***					
	(0.219)	(0.122)	(0.707)	(0.106)	(0.252)					
Democracy						0.151***	0.085***	-0.085	0.060***	0.023
						(0.047)	(0.027)	(0.146)	(0.023)	(0.060)
Observations	1,073	1,119	1,213	1,110	696	1,072	1,118	1,212	1,109	696
R-squared	0.525	0.814	0.485	0.752	0.910	0.530	0.812	0.485	0.754	0.909

The table displays the effects of democratization on various determinants of income. All models include country fixed effects and year fixed effects. I also control for income levels by adding log GDP capita. Heteroskedasticity-robust standard errors reported in parenthesis below estimates. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

IV. Democratization and Subnational Development in Africa

The national-level analysis establishes a robust positive relationship between democratization and income per capita. However, panel fixed effects models cannot fully rule out the possibility that unobserved time-varying factors are driving this relationship. If key variables are omitted, or if reverse causality is present, meaning higher income levels increase the likelihood of democratization rather than the other way around, the estimated effects may be biased.

To address these concerns, I leverage a natural experiment created by the historical partitioning of ethnic groups across African state borders. These borders, drawn with little regard for ethnic or cultural homogeneity, allow me to compare otherwise similar communities living under different political regimes. This within-ethnicity comparison mitigates concerns about confounding factors and other forms of endogeneity, providing more credible evidence on the causal effect of democratization on development outcomes.

IV.I Using African Borders as Natural Experiments

It is well documented that Africa's borders often divide ethnically homogeneous groups. Many ethnic groups that share a common language, history, and customs live on both sides of international boundaries. On average, approximately 40 percent of the African population belongs to these partitioned ethnic groups (Englebert, 2000; Englebert et al., 2002). In some extreme cases, such as Senegal, Burundi, Rwanda, and Zimbabwe, partitioned groups comprise more than 90 percent of the population (Alesina et al., 2011).

These borders were drawn during the late nineteenth century, at the height of the Scramble for Africa (Asiwaju, 1985). European colonial powers carved up the continent with limited knowledge of its interior and little concern for the long-term social or political implications. The primary goal was to formalize territorial claims and avoid conflict among colonial powers, not to establish viable or coherent future nation-states. As a result, many borders were delineated using vague geographic markers or through diplomatic agreements reached in European capitals, leading to arbitrary divisions of ethnic communities.

While this arbitrariness is widely acknowledged, some scholars argue that not all African borders were entirely random. Paine et al. (2024) contend that certain boundaries followed existing political frontiers or natural landmarks such as rivers and mountains. Others, however, such as Müller-Crepon et al. (2023), find that ethnic geography had only limited influence on the formation of African borders, especially when compared to other world regions.

My identification strategy acknowledges this debate but does not rely on the assumption that all African borders were drawn arbitrarily. Instead, it rests on the weaker and more plausible assumption that ethnic geography did not systematically shape the overall forma-

tion of borders across the continent. Even if some borders were drawn based on preexisting political or geographic features, their specific placements relative to ethnic settlement areas were largely uncoordinated. The quasi-random positioning of borders across ethnolinguistic homelands therefore supports the assumption of exogeneity in the context of partitioned groups.

The validity of my design would only be severely threatened if the act of partitioning itself had a direct and lasting impact on long-term development outcomes. Existing empirical research suggests this is unlikely. Studies show that partitioned and non-partitioned ethnic groups are not systematically different in ways that would independently affect long-term development (Michalopoulos and Papaioannou, 2016). My core identifying assumption is therefore that ethnic groups divided by colonial borders would have followed similar development trajectories absent differences in political regimes.

To strengthen this claim, I conduct a falsification test using a placebo border, a historical boundary that no longer separates communities under different political regimes. If my identification strategy is valid, I should find no meaningful development differences across this placebo border. This is precisely what the findings confirm, reinforcing the argument that regime type rather than underlying geographic, historical, or cultural differences drives the observed effects.

A final assumption underlying this identification strategy is that the key factor systematically changing at democracy-nondemocracy borders is political regime type itself. If other relevant characteristics also shift at the border, attributing development differences to democratization becomes more difficult.[2] However, I am not aware of other observable factors that consistently and systematically change across these borders in ways that would independently affect development outcomes.

IV.II Identifying Democratic-Nondemocratic Ethnic Partitions

I identify partitioned groups by overlaying contemporary African state borders on Murdock's (1959) ethnic map, which depicts the spatial distribution of more than 840 ethnic homelands across the continent. Figure **??** illustrates this overlay, with red lines representing modern African state borders and blue lines depicting ethnic boundaries.

Next, I classify countries as consolidated democracies and nondemocracies based on two strict criteria. First, a country must have exhibited a sustained democratic tradition, meaning it has been continuously classified as a democracy, as defined in Section III., since the 1990s. Countries with only temporary democratic episodes or recent democratic transitions after 2000 are excluded.

Second, the country must score highly on the liberal dimension of democracy, specifically

[2]For example, one would have to assume that only political regime type is affecting development at the border, which may not be realistic.

attaining an average annual libdem score of at least 0.50, the midpoint of the index, between 1990 and 2018. Although this threshold is somewhat arbitrary, incorporating the libdem measure is important because, as previously demonstrated, it has a strong association with economic performance. Because many African countries underperform on this dimension, a score of 0.50 represents a meaningful benchmark. To illustrate, countries like Lesotho (0.37), Malawi (0.36), Nigeria (0.27), and Zambia (0.38) meet the first criterion of sustained democratic tradition but fall below this libdem threshold. In effect, the analysis focuses on comparing Africa's most consistent and high-scoring democracies to their nondemocratic neighbors. This threshold is later relaxed in robustness checks.

Based on these criteria, eight African countries qualify as consolidated democracies: Benin, Botswana, Cabo Verde, Ghana, Mauritius, Namibia, São Tomé and Príncipe, and South Africa. Cabo Verde, Mauritius, and São Tomé and Príncipe are excluded because they are island nations without land borders. This leaves five consolidated democracies sharing borders with ten nondemocratic neighbors, namely Angola, Burkina Faso, Côte d'Ivoire, Eswatini, Mozambique, Niger, Nigeria, Togo, Zambia, and Zimbabwe. These democracy-nondemocracy borders are shown in Figure 6b.[3]

Along these borders, I identify 56 ethnic groups divided between a democratic and a nondemocratic state. To reduce measurement error from minor boundary overlaps due to digitizing, and to focus on partitions that are likely inhabited and economically relevant, I restrict the sample to ethnic groups with at least 5 percent of their homeland on either side of the border (Michalopoulos and Papaioannou, 2016, 2014). This restriction yields a final sample of 45 major partitioned ethnic groups across democratic-nondemocratic borders. Appendix Table A1 lists these groups along with the countries they are split into, the share of their homeland in each country, and the proportion located on the democratic side.

Most groups are split between two countries, though some are divided across three or even four. The democratic share of a group's territory varies widely, from 5.5 percent for the Busansi across Ghana, Burkina Faso, and Togo to 92.5 percent for the Dagombas across Ghana and Togo. For groups divided between two countries, the democratic share is simply the portion within the democratic state. For groups split across three or more countries, I aggregate the shares located in all democratic states. The Mbukushu, for instance, are spread across Angola (73.7 percent), Namibia (11.6 percent), and Botswana (14.7 percent), giving them a democratic share of 26.3 percent combining their territories in Namibia and Botswana. In effect, the regression discontinuity estimates capture the development gap between the democratic portion and the nondemocratic portion of each group's homeland. Using these partitioned ethnic groups allows me to estimate the causal effect of democratization under the assumption that partitions on either side of the same ethnic group's border represent valid counterfactuals. In essence, the democratic and nondemocratic partitions

[3]In Southern Africa, consolidated democracies form a contiguous bloc, allowing me to treat them as a single cluster separated from their nondemocratic neighbors.

are otherwise similar in terms of culture, language, institutions, and historical trajectory, so any persistent development gaps observed between them can be plausibly attributed to differences in regime type.

To illustrate this logic concretely, consider the Adele group, shown in Figure 7a. The Adele are partitioned across the Ghana-Togo border, with roughly half of their homeland in each country. Prior to the mid-1990s, both sides of the Adele partition lived under nondemocratic rule. This changed when Ghana transitioned to democracy in the 1990s. Figure 7b shows that Ghana's democratic transition is dated to the mid-1990s (under this paper's coding of democracy), while Togo has remained nondemocratic throughout the sample period. As a result, the two sides of the Adele partition now face starkly different political regimes despite sharing the same ancestry, language, and geography. It is precisely this variation in regime type – generated by a colonial border rather than by any difference in the communities themselves – that this paper exploits to identify the long-term developmental effects of democratization.

IV.III Threats to Identification

The most significant threat to my identification strategy is the potential for selective migration across democratic and nondemocratic partitions. If individuals systematically relocate based on regime type, for example moving from nondemocratic to democratic areas in search of better opportunities, then observed development differences may reflect migration dynamics rather than the causal effect of democratization itself. Addressing this concern is challenging, especially when the analysis spans a wide range of borders and ethnic partitions. But it is essential to assess whether the estimated effects are genuinely driven by differences in political regime or by underlying population movements.

Understanding the likely direction of potential bias is important for interpreting the results, because it determines whether any migration-induced distortion would cause the estimates to overstate or understate the true effect of democratization. If, for example, young, educated, or wealthier individuals disproportionately migrate toward democratic areas, development outcomes on the democratic side could be overstated.

To investigate this possibility, I examine predetermined individual-level characteristics including age, gender, and type of residence across democratic and nondemocratic partitions, using Afrobarometer survey data from rounds 5 through 8.[4] I test for discontinuities in these characteristics across borders by fitting separate slopes for each side of the border within 50 km and 100 km radii. The results are presented in Appendix Table A2.

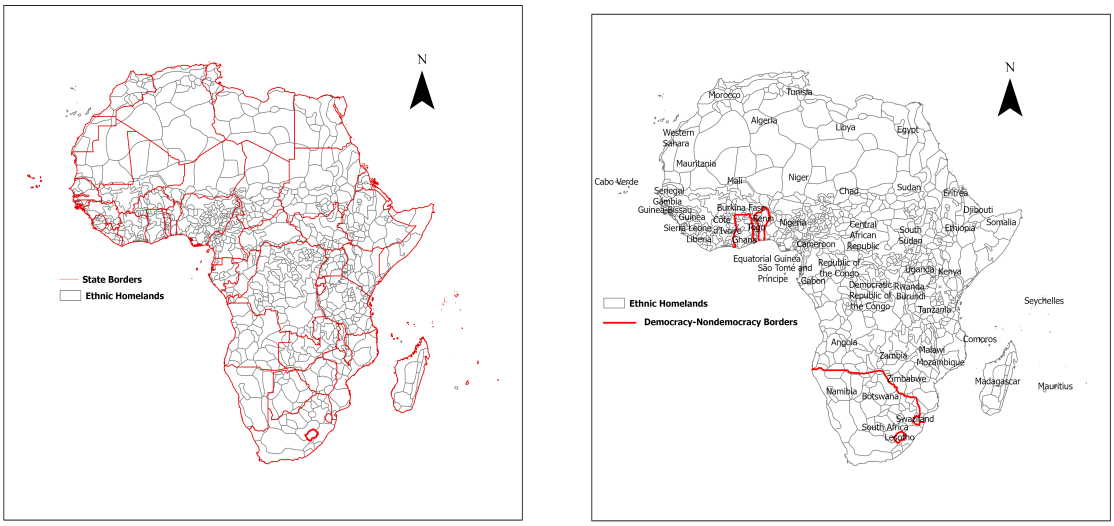
Within the narrow 50 km window, there are no statistically significant differences in age or gender between democratic and nondemocratic sides, suggesting limited selective migra-

[4]While type of residence is not strictly predetermined, it provides useful insights into migration patterns, since rural areas are typically out-migration zones whereas urban areas are often migration destinations.

tion. In the wider 100 km window, gender remains statistically similar, but age shows a slightly negative and marginally significant coefficient, indicating that the population on the democratic side is marginally younger. More notably, across both windows, democratic areas tend to be more rural than their nondemocratic counterparts. Since rural areas usually out-migration areas and typically score lower on development indicators, any bias in my estimates is likely to be conservative.

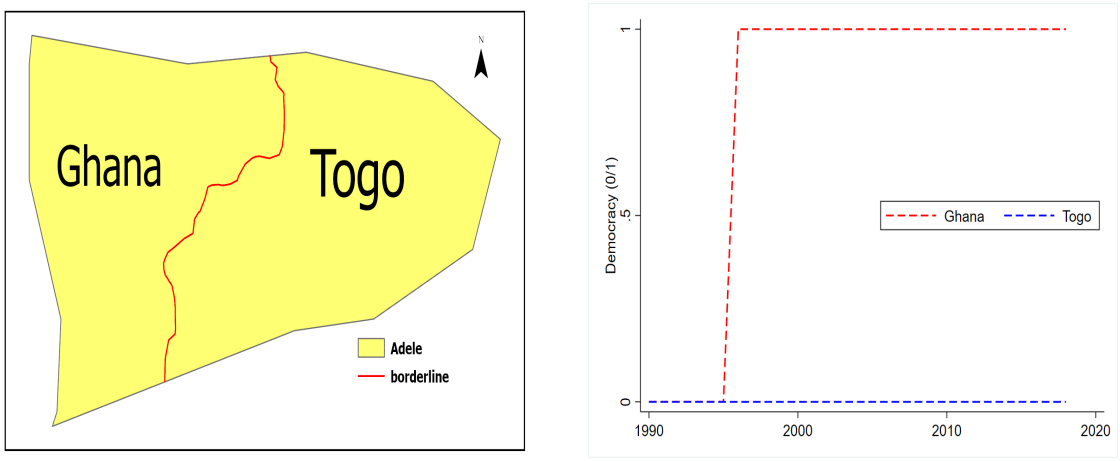
It is important to note that selective migration is only a concern for survey-based outcomes. The risk is much less severe when using aggregate proxies of development, such as nighttime lights, which are less sensitive to individual-level movements. Migration would only bias light-based estimates if it led to disproportionate urban growth on one side of the border, however most African border regions lack large urban centers. Moreover, I explicitly exclude capital and major commercial cities from the analysis to further mitigate this concern, and I also binary-transform the nighttime light data to reduce the influence of extreme values from urban agglomerations.

A second potential threat is that democratic and nondemocratic partitions may have already diverged in development prior to the democratization wave of the 1990s. However, as the RD estimates in Section V. will show, development levels across these borders were comparable in the early democratization years, suggesting that any pre-existing differences had either dissipated or were negligible by the time democratic transitions began. This pre-treatment comparability further strengthens the case that observed gaps are causally linked to differences in political regime.



(a) (b)

Figure 6: The left panel shows Africa's contemporary state borders superimposed on ethnic homelands. The right panel depicts borders dividing top democracies and nondemocracies in Africa.



(a) (b)

Figure 7: The left panel shows the Adele group partitioned across the Ghana-Togo border. The right panel shows the duration of democracy for Ghana and Togo.

IV.IV Estimation Framework I: Panel Fixed Effects Estimation

The subnational analysis begins with a panel fixed effects regression at the grid cell level. Each grid cell is assigned the annual libdem score and binary democracy status of the country in which it is located. The specification takes the following form:

$$y_{gt} = \beta Democ_{gt} + \gamma_t + \phi_g + \varepsilon_{gt} \tag{2}$$

Here, y_{gt} is the development outcome for grid cell g in year t, measured by nighttime light density. The key independent variable, $Democ_{gt}$, represents the democratic status of grid g in year t, measured using both the libdem index and the binary classification. Year fixed effects γ_t absorb year-specific shocks common to all grid cells, while grid cell fixed effects ϕ_g control for unobserved time-invariant characteristics at the cell level, such as geography, historical infrastructure, and long-standing ethnic compositions.

IV.V Estimation Framework II: Regression Discontinuity

The second estimation strategy is a geographic regression discontinuity design. For each year t from 1992 to 2013, I estimate the following cross-sectional specification separately:

$$y_{ic} = \alpha + \tau D_{ic} + f(B_{ic}) + \eta_e + \xi_{ic} \tag{3}$$

The dependent variable y_{ic} denotes the development outcome, either nighttime lights or individual-level socioeconomic indicators, for unit i in country c. The key explanatory variable D_{ic} is a binary indicator equal to 1 if unit i is located on the democratic side of the

border and 0 if it is on the nondemocratic side.

The function $f(B_{ic})$ is a polynomial function of the geodesic distance from unit i to the closest regime-separating border. My preferred specification uses local linear regression within a 50 km radius, which corresponds to a 100 km bandwidth, with separate slopes estimated on the democratic and nondemocratic sides. Local linear fits are preferred over higher-order polynomials because they reduce the risk of overfitting and boundary bias and are less sensitive to outliers and endpoint anomalies (Gelman and Imbens, 2019).

The use of narrow windows around the border introduces a bias-variance tradeoff. A smaller bandwidth reduces bias by restricting the analysis to geographically proximate units more likely to share both observed and unobserved characteristics, but it also reduces the number of observations and increases variance (Cattaneo et al., 2019; Fan and Gijbels, 1996). To assess robustness, I supplement the baseline estimates with specifications using wider bandwidths, higher-order polynomial fits, and optimal bandwidth selection methods.

The specification includes ethnicity fixed effects, η_e, which control for time-invariant group-level characteristics such as shared language, cultural norms, and historical institutions. Importantly, the ethnicity fixed effects ensure that the comparisons are conducted within ethnic groups, isolating regime type as the primary source of variation across the border. To put it simply, each partitioned group has one segment residing under a democratic regime (ρ) and another under a nondemocratic regime (1 - ρ), enabling a clean within-ethnicity comparison.

The coefficient of interest, τ, captures the local average treatment effect (LATE) of democratization on development outcomes in a given year. Since treatment effects may vary spatially across different border segments, τ is interpreted as the average of the local average treatment effects across all points where regime status changes discontinuously at the boundary (Keele and Titiunik, 2015). By estimating specification 3 separately for each year, I obtain a sequence of annual coefficients $\hat{\tau}_t$ that trace how the development gap between democratic and nondemocratic partitions evolved over time.

IV.VI Data

IV.VI.I Measuring Subnational Development

Subnational income statistics at fine spatial resolutions are largely unavailable for African countries, yet such data are essential for conducting credible analyses within border regions. To address this limitation, I use nighttime light density as a proxy for subnational development. The data are drawn from the Defense Meteorological Satellite Program's Operational Line-Scan System (DMSP-OLS), which covers 1992 to 2013. The DMSP-OLS satellites capture images of the Earth's surface each night, spanning longitudes -180 to 180 degrees and latitudes -65 to 75 degrees. The satellite images are processed to filter out cloud cover, temporary light sources such as lightning or wildfires, and other signal-distorting noise.

The processed images are then divided into pixels, each measuring approximately 1 square kilometer. Each pixel is assigned a digital number (DN) ranging from 0 to 63, where 0 indicates no detectable light and higher values indicate greater light intensity.

Nighttime light density has become a widely accepted proxy for income and development in settings where official economic statistics are sparse, unreliable, or susceptible to political manipulation (Martinez, 2022). Prior work demonstrates that light-based measures correlate strongly with local income levels and welfare outcomes (Henderson et al., 2012), and the high spatial resolution of the data allows for granular tracking of development patterns in border areas.

To implement the border analysis, I construct square grid cells measuring 10 km by 10 km and extract the nighttime light value for each cell in every year from 1992 to 2013. Using grid cells rather than administrative units ensures spatial precision and allows me to measure development patterns independently of colonial or postcolonial boundary structures. Equal-sized grid cells also reduce concerns that observed differences are mechanically driven by historical administrative demarcations.

IV.VI.II Individual-level Outcomes

I complement the nighttime lights analysis with individual-level data from Afrobarometer survey rounds 5 through 8 to assess disparities in socioeconomic outcomes across democratic-nondemocratic partitions. Afrobarometer is an independent, not-for-profit organization that conducts nationally representative opinion polls on political, economic, and social issues in over 30 African countries. Each round samples either 1,200 or 2,400 respondents per country using standardized questionnaires. For this study, I restrict attention to questions consistently available across all survey rounds and countries to ensure comparability for cross-border analysis.

To identify respondents from partitioned ethnic groups, I extract ethnicity information from the Afrobarometer data and match it to the 45 major partitioned groups from Murdock's ethnic map. Because ethnic group names in Afrobarometer do not always align exactly with Murdock's labels, I cross-reference alternative names using Encyclopedia Britannica, Oxford Reference, and Joshua Project. This systematic cross-validation enables accurate assignment of survey respondents to partitioned ethnic groups.

The analysis focuses on five socioeconomic outcomes. The first is an economic insecurity index that captures how frequently respondents face shortages of essential needs. Afrobarometer asks respondents how often they or anyone in their family went without food, clean water, medical care, cooking fuel, or cash income over the past year, with each item scored from 0 (never) to 4 (always). For each respondent i, I compute the average response across the five items and standardize it to a 0 to 100 scale, where higher values indicate

greater insecurity:

$$\text{standardized econins}_i = \frac{\text{econins}_i}{4} \times 100$$

The second outcome is subjective wellbeing, measured using the question "In general, how would you describe your own present living conditions?" Responses range from 1 (very bad) to 5 (very good). I define a binary variable equal to 1 if the respondent rates his/her conditions as fairly good or very good and 0 otherwise.The third outcome is educational attainment, proxied using Afrobarometer's 0 to 9 scale, where 0 indicates no formal education and 9 represents postgraduate education. I construct a binary variable equal to 1 if the respondent has completed at least secondary education and 0 otherwise.

The fourth outcome is waged employment, measured through a question asking whether the respondent has a job that pays a cash income and whether it is full-time or part-time. I define a binary employment variable equal to 1 if the respondent is working part-time or full-time in a waged job and 0 otherwise. The fifth outcome captures access to public goods. Afrobarometer interviewers record whether electricity, piped water, paved roads, and sewage systems are available within walking distance of respondents' residences. Access to these amenities serves as a proxy for government performance and infrastructure development.

Table 3 summarizes these variables for individuals from partitioned ethnic groups residing within 50 km of democratic-nondemocratic borders. The sample includes between 6,989 and 7,022 individuals and is roughly gender-balanced. Given the rural nature of border areas, approximately 58 percent of respondents live in rural locations.

Among the five economic insecurity components, cash income shortages are most frequently reported, followed by medical care shortages, while fuel for cooking is the least commonly cited. Pairwise correlations among the components are all positive and moderately strong, ranging from 0.34 between clean water and cooking fuel to 0.51 between cash income and medical care.

The average economic insecurity index is 35.71 out of 100. Yet only 28.6 percent of respondents rate their living conditions as fairly good or very good, a gap that likely reflects the multidimensional nature of wellbeing, which encompasses dimensions of security and dignity that a shortage index alone cannot fully capture. Educational attainment is low, with only 22 percent completing secondary school or higher, and only one-third of respondents report holding a waged job. In terms of infrastructure, 64 percent report access to electricity and 57 percent report piped water nearby, though access to sewage systems remains limited.

Comparing respondents across democratic and nondemocratic partitions reveals substantial raw differences across all outcomes. Economic insecurity is 12.4 percentage points lower on the democratic side, and subjective wellbeing, education, and employment rates are all higher. Public goods access is also better on the democratic side, particularly for electricity and piped water. These descriptive differences are consistent with the developmental

benefits of democratic governance documented in the formal results that follow.

Table 3: Summary Statistics of Individual-level Data

	Whole Sample					Democratic Partitions			Nondemocratic Partitions		
	(1) N	(2) mean	(3) min	(4) max	(5) sd	(6) N	(7) mean	(8) sd	(9) N	(10) mean	(11) sd
age	6,989	36.38	18	100	14.31	4,191	36.71	14.31	2,798	35.88	14.29
female	7,022	0.496	0	1	0.500	4,211	0.497	0.500	2,811	0.496	0.500
rural	7,022	0.580	0	1	0.494	4,211	0.557	0.497	2,811	0.614	0.487
food shortage	7,018	1.150	0	4	1.228	4,209	1.036	1.189	2,809	1.323	1.265
water shortage	7,015	1.323	0	4	1.449	4,207	1.101	1.354	2,808	1.657	1.521
med care shortage	7,001	1.390	0	4	1.308	4,199	1.140	1.221	2,802	1.763	1.345
cooking fuel shortage	7,009	0.868	0	4	1.151	4,203	0.735	1.089	2,806	1.067	1.211
income shortage	7,009	2.413	0	4	1.301	4,206	2.141	1.304	2,803	2.821	1.185
economic insecurity	6,983	35.71	0	100	23.72	4,192	30.74	22.89	2,791	43.17	22.99
employment status	7,015	0.294	0	1	0.456	4,206	0.327	0.469	2,809	0.244	0.430
min. secondary comp.	7,012	0.222	0	1	0.416	4,203	0.237	0.425	2,809	0.200	0.400
subjective wellbeing	6,989	0.286	0	1	0.452	4,196	0.311	0.463	2,793	0.248	0.432
electricity grid	7,014	0.639	0	1	0.480	4,203	0.667	0.471	2,811	0.598	0.490
piped water	6,925	0.565	0	1	0.496	4,175	0.592	0.492	2,750	0.524	0.500
sewage system	6,992	0.212	0	1	0.409	4,195	0.235	0.424	2,797	0.177	0.382
paved road	7,015	0.300	0	1	0.458	4,204	0.323	0.468	2,811	0.266	0.442

V. Results

This section presents the main results on the impact of democratization on subnational development. The analysis proceeds in two parts. I begin with the grid cell panel fixed effects estimates, which establish the average relationship between democratization and local development across all partitioned ethnic homelands. I then present the geographic regression discontinuity estimates, which provide the causal evidence by exploiting the sharp regime change at democracy-nondemocracy borders.

V.I Panel Fixed Effects Estimates

Table 4 presents the panel fixed effects estimates of the impact of democratization on development within partitioned ethnic homelands. Columns (1) through (3) examine the relationship between nighttime light density and the liberal democracy index, while columns (4) through (6) use the binary democracy indicator. Each set of columns reports results using three forms of nighttime light data: a binary indicator for whether a grid cell is lit, the raw mean light density, and the log-transformed light density. These three measures capture different aspects of subnational development and allow assessment of whether the results are sensitive to how the outcome is operationalized.[5]

[5]The binary indicator captures the extensive margin of development, that is, whether any detectable economic activity is present in a given location. The raw mean light density captures the intensive margin, measuring the level of economic activity where light is present. The log-transformed measure compresses the distribution of raw light values, reducing the influence of extreme observations.

Panel A shows results for the preferred sample, comprising grid cells located within 50 kilometers of a democratic-nondemocratic border. Across all specifications in Panel A, both the continuous and binary democracy measures have statistically significant positive effects on light density. A full-range increase in the liberal democracy index from 0 to 1 raises the probability that a grid cell has nighttime light by 16 percentage points (pp). Being under a democratic regime as opposed to a nondemocratic one increases this probability by approximately 3.5 pp. These subnational estimates are broadly consistent with the national-level income effects documented in Section III., reinforcing the view that democratization generates tangible development gains at multiple levels of aggregation.

Panel B expands the analysis to the full sample of partitioned ethnic homelands, including grid cells beyond the 50 km border radius. The results remain directionally consistent with Panel A, though the estimated coefficients are somewhat larger, likely reflecting the confounding influence of unobserved factors that the wider sample is less able to control for.

V.II RD Estimates of Subnational Development Disparities

Before presenting the RD estimates, I first examine the raw trends in nighttime light density across democratic and nondemocratic partitions. This descriptive step helps contextualize the formal RD estimates that follow.

Figures 8a and 8b plot the average annual probability that a grid cell is lit, separately for democratic and nondemocratic sides. Figure 8a focuses on the 50 km radius sample while Figure 8b covers the entire sample of partitioned ethnic groups. Two patterns emerge. First, lighting levels were very similar on both sides of the border in the early years of democratization. In 1994, for instance, the average probability of being lit was 0.08 on the democratic side and 0.07 on the nondemocratic side within the 50 km window. Second, from 1995 onward, democratic partitions began to experience faster increases in lighting, suggesting that the development advantage of democratic governance accumulated gradually over time.

Figures 9a and 9b present the formal RD estimates of the development gap across the border using a binary outcome for lighting.[6] The top panel of Figure 9a presents RD estimates within the 50 km window. The results show that in the early 1990s, the coefficients are small and statistically insignificant, indicating no meaningful pre-existing development differences across the borders. From the mid-1990s onward, the estimates grow steadily in magnitude and statistical significance. By 2013, a grid cell in a democratic partition was 7 pp more likely to be lit than its nondemocratic counterpart. This represents a development gain of approximately 37 percent (sample mean: 0.19), a substantial effect given the subnational

[6]The binary specification mitigates the influence of outliers and allows for intuitive interpretation, given that nighttime light lacks a natural measurement unit. Results for most odd years are omitted for visual clarity.

context.

The bottom panel of Figure 9b shows RD estimates for the full sample of partitioned ethnic homelands. The results closely mirror those from the narrower window. This consistency is informative on two fronts. Firstly, it confirms that the estimated effects are not sensitive to the choice of bandwidth. Secondly, it suggests that the development gains from democratization are not confined to a narrow geographic strip immediately adjacent to the border but extend across the full ethnic homelands, which strengthens the external validity of the findings.

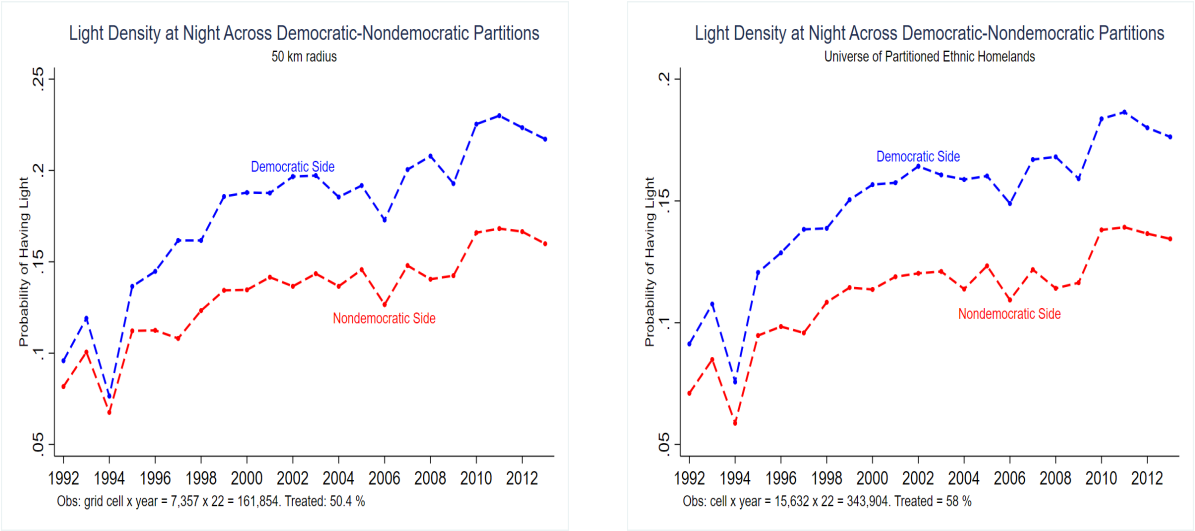
To illustrate these patterns more concretely, I examine two case studies using the Adele and Ambo, the first two ethnic groups listed in Appendix Table A1. The Adele are split between Ghana, a democracy, and Togo, a nondemocracy, with 48 percent and 52 percent of their homeland in each country respectively. Figures 10a through 10c show that in 1992, neither side had any lit grid cells. Over time, grid cells on the Ghanaian side began to light up while the Togolese side remained largely dark, a striking visual illustration of the development divergence documented in the formal estimates.

The Ambo group is partitioned between Angola, a nondemocracy, and Namibia, a democracy, with 41 percent and 59 percent of their homeland on each side respectively. As shown in Figures 10d through 10f, both sides of the Ambo partition had some light in 1992. Over time, both experienced increases in lighting, but the gains were substantially larger on the Namibian side. The Ambo case illustrates an important nuance: development can occur in the absence of democracy, but the evidence shows clearly that democratic governance accelerates the pace of local development.

Table 4: Impact of Democratization on Light Density at Night

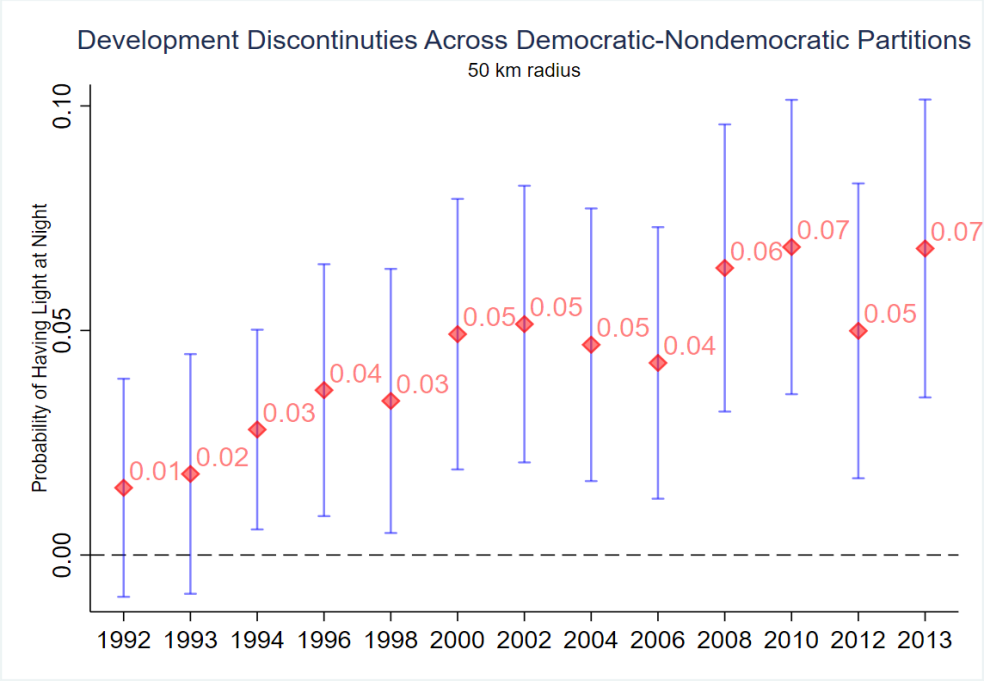
	(1) lit cell	(2) mean light	(3) log light	(4) cell lit	(5) mean light	(6) log light
	Panel A. 50 km Radius Around Democratic-Nondemocratic Ethnic Partitions					
Liberal Democracy Index	0.160***	0.447***	0.717***			
	(0.017)	(0.071)	(0.071)			
Democracy(1/0)				0.035***	0.059***	0.155***
				(0.005)	(0.022)	(0.023)
Observations	144,364	144,364	144,364	144,364	144,364	144,364
R-squared	0.743	0.870	0.837	0.742	0.869	0.837
Grid Cell F.E.	YES	YES	YES	YES	YES	YES
Year F.E.	YES	YES	YES	YES	YES	YES
	Panel B. Universe of Democratic-Nondemocratic Ethnic Partitions					
Liberal Democracy Index	0.196***	0.980***	1.108***			
	(0.011)	(0.056)	(0.052)			
Democracy (1/0)				0.040***	0.081***	0.175***
				(0.004)	(0.019)	(0.017)
Observations	326,282	326,282	326,282	326,282	326,282	326,282
R-squared	0.770	0.899	0.861	0.769	0.898	0.860
Grid Cell F.E.	YES	YES	YES	YES	YES	YES
Year F.E.	YES	YES	YES	YES	YES	YES

The table displays the panel fixed effects estimates of the impact of democratization on subnational development within democratic-nondemocratic ethnic partitions in Africa. Subnational development is proxied by light density at night and the unit of analysis is a 10 km x 10 km grid cell. All models include grid cell and year fixed effects. In columns (1) and (4) the outcome variable takes a value one if the grid cell has light and zero otherwise. In columns (2) and (5) the grid cell's mean light density is used as the dependent variable whereas in columns (3) and (6) the dependent variable is the natural logarithm of mean light density (y= ln(.01 + mean light)). Panel A shows estimates within 50 km from borders separating democratic and nondemocratic ethnic partitions whereas Panel B shows estimates for the universe of democratic-nondemocratic ethnic partitions. Standard errors clustered at the grid cell. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

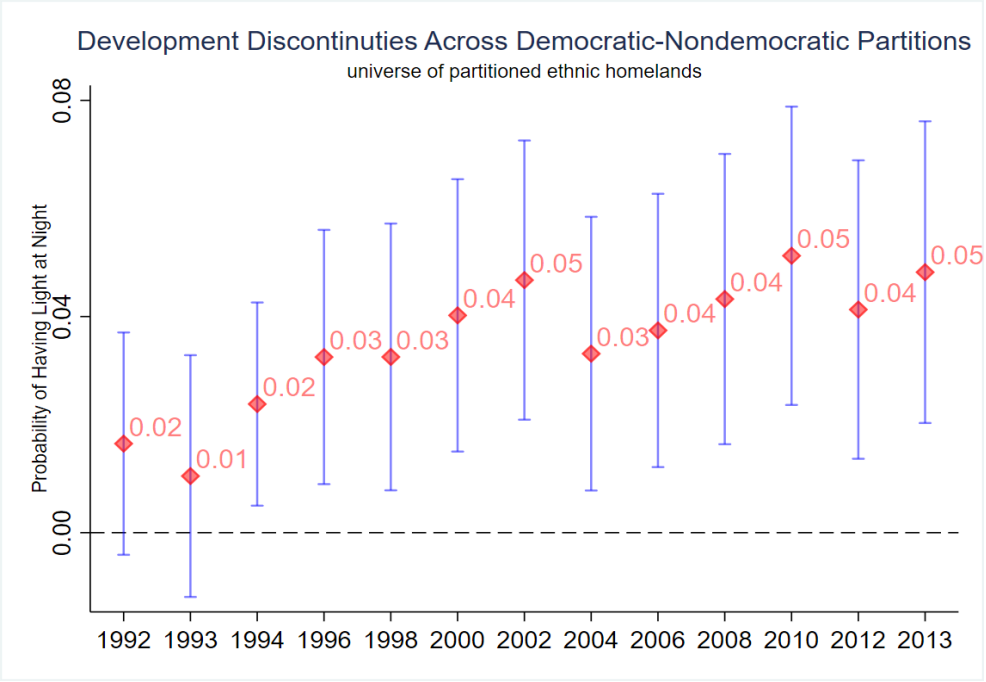


(a) (b)

Figure 8: The figures display the yearly mean probabilities of a grid cell having light at night within democratic-nondemocratic partitions. The left panel shows trends for grid cells within a 50 km radius while the right panel shows trends for the universe of democratic-nondemocratic partitions.

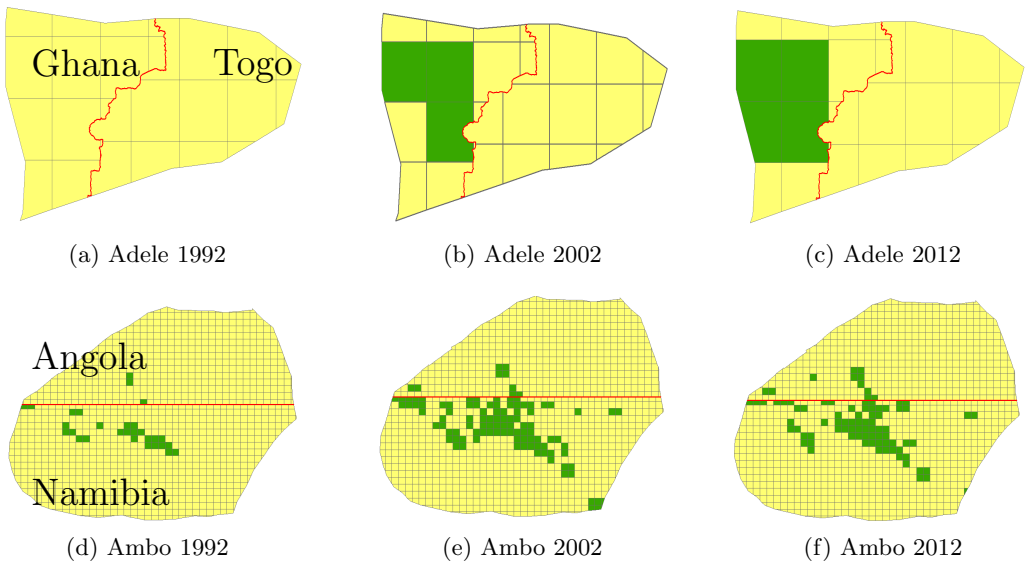


(a)



(b)

Figure 9: The figures display RD estimates of subnational development disparities across democratic-nondemocratic partitions. The top panel shows estimates from the 50 km radius around borders while the bottom panel displays estimates from a 100 km radius, with all models including ethnicity fixed effects.



(a) Adele 1992 (b) Adele 2002 (c) Adele 2012

(d) Ambo 1992 (e) Ambo 2002 (f) Ambo 2012

Figure 10: The figures display decadal changes in lit and unlit grid cells for two samples of partitioned groups residing astride borders dividing a consolidated democracy and a nondemocracy. The top row shows the Adele group across the Ghana-Togo border and the bottom row shows the Ambo group across the Angola-Namibia border, with the democratic side being Ghana and Namibia respectively.

V.III Sensitivity Checks

I assess the robustness of the main RD estimates using a range of alternative specifications and diagnostic checks. All sensitivity checks are confined to the 50 km radius sample to maintain consistency with the preferred specification, and results prior to 1996 are omitted from tables for brevity.

V.III.I Changing the Dependent Variable

The first check replaces the binary nighttime light outcome with the actual continuous mean light density of each grid cell, allowing me to examine whether the observed effects persist when using a more granular proxy for development. The estimates, presented in Appendix Figure A1, confirm the robustness of the findings. Development disparities between democratic and nondemocratic partitions were negligible in the early years but grew steadily over time. By 2013, being in a democratic partition is associated with a 64 percent increase in mean light density relative to the sample mean, indicating a substantial and growing development advantage.[7]

[7] I also perform unreported checks using the natural logarithm of light density and a sine transformation to account for skewness in the distribution. Both yield results consistent with the main findings.

V.III.II Adding Covariates

The second check conditions the RD estimates on a set of geographic and location-specific covariates, including distance to the nearest river (km), distance to the seacoast (km), average annual precipitation (mm), elevation (m), slope (degrees), and the log of grid cell size.[8] While covariates in a narrow RD neighborhood primarily improve estimation precision, in this scenario their inclusion also helps rule out the possibility that observed development disparities are driven by underlying environmental or locational differences across borders. The results, presented in Appendix Figure A2, show that the point estimates remain nearly unchanged from the baseline while confidence intervals narrow. This stability confirms that the observed development gains on the democratic side are not driven by omitted geographic and/or location-specific factors.

V.III.III Controlling for Population Patterns and Preexisting Development

The third check addresses the possibility that differences in population clustering or settlement patterns rather than political regime type are driving the observed development gaps. Since nighttime light density reflects human settlement and economic activity, areas with little or no population are unlikely to emit light regardless of regime type.

To account for this, I regress log light density on log population density for all border grid cells, using gridded population data from the United Nations derived from national censuses and interpolated across countries and time.[9] I control for population density in 1960, which marks the beginning of state-building efforts across much of Africa, and in 1990, which immediately precedes (or marks the beginning of) the democratization wave. Controlling for both benchmarks mitigates concerns about historical and post-colonial development trajectories.

The results, presented in Appendix Figure A3, reinforce the baseline findings. During the early years of democratization there were no significant differences in light density across borders, but from 1994 onward the RD estimates become larger and statistically significant. These results confirm that the documented disparities are not driven by population clustering or pre-existing differences in settlement patterns.

[8] Grid cell size is included as a control since cells near coastlines or borders may be truncated due to geographical boundaries.

[9] Using the raw (continuous) measure of light rather than a binary indicator is important here. While binary lighting simply captures whether a cell is lit or not, it does not account for variation in intensity, which is often correlated with population density. For example, densely populated areas are not just more likely to be lit, but also tend to emit stronger light. A binary measure would ignore this variation, potentially biasing results.

V.III.IV Two-dimensional RD

The fourth check implements a two-dimensional RD specification to ensure that spatial variation does not confound the baseline estimates. Rather than relying solely on perpendicular distance to the border as the running variable, this approach controls for the precise geographic location of each grid cell by including polynomial terms in both latitude and longitude. Following Dell (2010), the specification adds the terms $x + y + x^2 + y^2 + xy + x^3 + y^3 + x^2y + xy^2$, where x and y denote longitude and latitude respectively.

This functional form allows for richer spatial trends and curvature in the data, capturing localized variations in development that may otherwise bias the estimates. For example, some parts of a border may follow a river or mountain range, while others may pass through more homogenous terrain. Including polynomial terms in both dimensions helps account for such non-linearities and spatial heterogeneity in a way that unidimensional distance-based models cannot accommodate. However, the added flexibility increases the risk of overfitting in narrow bandwidths. But the results, presented in Panel A of Appendix Table A3, remain consistent in magnitude and significance with the baseline estimates, suggesting that the main results are not driven by misspecification of the functional relationship between location and development.

V.III.V Allowing for Ethnic Partition-Specific Development Slopes

The baseline specification assumes that development trends evolve uniformly on each side of the border across all 45 partitioned groups, which may not hold given the considerable variation in geography, history, and socio-political context across groups. This check relaxes the assumption of a common slope in the running variable across all ethnic partitions. Specifically, I allow for group-specific slopes by assigning a unique slope to each of the 45 partitioned groups on both the democratic and nondemocratic sides, yielding 90 distinct slopes in total. This more flexible parameterization allows development trends to vary across ethnic homelands and helps control for spatial heterogeneity correlated with ethnic identity and geography. The results, reported in Panel B of Appendix Table A3, remain consistent with the baseline, confirming that the documented disparities reflect a genuine relationship between regime type and subnational development rather than an artifact of the common slope assumption.

V.III.VI Using Optimal Bandwidth Selectors to Validate RD Estimates

The sixth check uses data-driven bandwidth selection as an alternative to the fixed 50 km window. I apply optimal mean squared error bandwidth estimators with a triangular kernel and report estimates from three commonly used selectors, namely the conventional estimator, the bias-corrected estimator, and the robust bias-corrected estimator. These

estimators balance the bias-variance trade-off by selecting the bandwidth that minimizes the mean squared error of the local polynomial estimator. This improves statistical efficiency by tailoring the estimation window to the data's distribution rather than imposing a fixed geographic threshold.

The results, reported in Panel C of Appendix Table A3, are highly consistent across all three methods. Estimates for 1992 and 1993 (not shown) are small and jointly insignificant across all three selectors, consistent with pre-treatment comparability. From the mid-1990s onward, the development disparities become large and statistically significant, confirming that the baseline findings are not driven by the arbitrary choice of a fixed geographic threshold.

V.III.VII Alternative Classification of Consolidated Democratic Regimes

The seventh and final check assesses whether the results are sensitive to how consolidated democracies are classified. The baseline classification requires countries to have maintained continuous democratic status since the 1990s and to have achieved a libdem score of at least 0.50. To verify that the findings do not depend on the libdem threshold, I adopt an alternative classification that relies solely on the binary democracy indicator, dropping the libdem requirement entirely.

Under this criterion, a country qualifies as a consolidated democracy if it has continuously scored above zero on the Polity2 scale since the 1990s and has maintained at least a partly free rating from Freedom House. This alternative classification adds five countries – Malawi, Mozambique, Nigeria, Zambia, and Lesotho – to the group of consolidated democracies.[10] This yields nine consolidated democracies sharing land borders with eleven nondemocratic neighbors, spanning 117 partitioned ethnic groups of which 85, roughly 73 percent, qualify as major partitions. The updated borders and ethnic partitions are illustrated in Appendix Figure A4.

The RD results under this alternative classification, shown in Appendix Figure A5, show slightly smaller point estimates than the baseline, but the main patterns remain intact. The reduction in effect size is unsurprising. The alternative classification pairs institutionally weaker democracies against their nondemocratic neighbors (for example Mozambique against Zimbabwe), producing less stark contrasts than those between high-performing democracies like Ghana against Togo or Namibia against Angola. Nonetheless, the estimates remain statistically significant and economically meaningful. In 2012 and 2013, the development gap translates into approximately a 38 percent increase in the probability of being lit relative to the sample mean.

As a further check, I test whether the results hold using a threshold based on the median libdem score (0.223) across countries during the sample period. Countries with average

[10] Lesotho is excluded because it is entirely surrounded by South Africa.

scores above the median are coded as democracies and those below as nondemocracies. This approach yields the same country classification as the current alternative binary criterion, providing further reassurance that the findings are not sensitive to the particular libdem threshold chosen for the baseline analysis.

V.III.VIII Clean Control Group

The baseline analysis classifies countries as nondemocratic if they did not satisfy the consolidated democracy criteria. However, some countries in the control group partially satisfied the classification criteria, meeting either the strict democracy requirement or the libdem threshold but not both. Including these ambiguous cases in the control group potentially attenuates the estimated treatment effects by comparing consolidated democracies against countries that are neither clearly democratic nor clearly nondemocratic. To address this concern, I construct a clean control group by dropping countries that satisfied one criterion but not the other. Specifically, I drop Nigeria, Zambia, and Mozambique, which transitioned to democracy in the 1990s but failed the libdem threshold. As a consequence, I also drop the partitioned ethnic groups that straddle the borders involving these countries.
The results are presented in Appendix Figure A6. The point estimates are stable and if anything slightly larger than the baseline, with the 2013 development gap rising to 8 pp compared to 7 pp in the main specification. This pattern suggests that the ambiguous control countries were modestly attenuating the baseline estimates rather than inflating them. The findings confirm that the main results are not driven by contamination from partially democratic control countries.

V.IV RD Estimates of Individual-level Disparities

Nighttime light density captures aggregate economic activity at the subnational level but cannot speak directly to how development gains are distributed across individuals or whether they translate into improvements in lived conditions. The individual-level evidence here addresses both of these questions. Table 5 presents the RD estimates using individual-level survey data, with Panel A showing results for respondents residing within 50 kilometers of a border and Panel B expanding the analysis to all members of partitioned ethnic groups. Panel A reveals statistically and economically significant advantages for individuals living on the democratic side of partitioned ethnic homelands across every dimension measured. Economic insecurity, measured on a 0 to 100 scale, is reduced by 23.5 percentage points (pp), representing a 66 percent decline relative to the sample mean. Subjective wellbeing improves by approximately 26 percent above the mean. Respondents on the democratic side are also 10.2 pp more likely to have completed at least secondary education and 26.5 pp more likely to be employed in a waged job. These magnitudes are substantial and indicate that the development advantages of consolidated democratic governance extend well

beyond aggregate economic output to the individual circumstances of ordinary people.

The democratic advantage extends further to physical infrastructure and access to state-provided services. Living on the democratic side of the border increases the likelihood of access to electricity by 21.5 pp, access to paved roads by 11.5 pp, and access to a sewage system by 11.1 pp. While the coefficient for piped water is also positive, it does not reach conventional levels of statistical significance. In sum, these results suggest that democratic governance improves not only the economic security and educational prospects of individuals but also the quality of the physical environment in which they live.

Panel B extends the sample to include all members of partitioned ethnic groups regardless of current residence. This more inclusive approach substantially increases the sample size, yet the direction, magnitude, and statistical significance of the estimates are preserved across all outcomes. Residents of democratic partitions continue to report lower economic insecurity, higher subjective wellbeing, greater educational attainment, higher waged employment, and better access to public infrastructure relative to their counterparts on the nondemocratic side.

The consistency of results across the two panels can be attributed to two factors. First, the within-ethnicity comparison structure is preserved in Panel B in the sense that the ethnicity fixed effects continue to ensure that all comparisons are made between members of the same ethnic group on opposite sides of the border. However, the 50 km border window used in Panel A gives more credible identification because individuals living in close geographic proximity to the border on opposite sides are more plausibly similar in unobserved characteristics than those living further away. The consistency of results across the two panels only suggests that the findings are not sensitive to this bandwidth choice, even as the identification assumptions become somewhat weaker in the broader sample.

Second, the similarity in estimates across panels provides further reassurance about the robustness of the findings. Panel B includes individuals residing further from the border on both sides, meaning that differences between panels could reflect the spatial gradient of development within each partition as well as any migration effects, and these two forces cannot be cleanly separated through this comparison alone. Nonetheless, the fact that the estimates remain stable despite this broader sample suggests that neither the spatial gradient of development nor migration-induced composition effects are large enough to materially alter the core finding. This stability corroborates the more direct evidence from Section IV. showing no significant discontinuities in predetermined demographic characteristics across the border.

Table 5: Socioeconomic Disparities Across Democratic-Nondemocratic Partitions

	(1) economic insecurity	(2) subjective wellbeing	(3) education	(4) employment status	(5) paved road	(6) electricity	(7) piped water	(8) sewage system
				Panel A. 50 km radius around border				
treated	-23.467***	0.074***	0.102***	0.265***	0.115**	0.215***	0.055	0.111**
	(1.452)	(0.026)	(0.024)	(0.029)	(0.052)	(0.041)	(0.053)	(0.046)
Observations	6,949	6,953	6,976	6,979	6,979	6,978	6,889	6,956
R-squared	0.208	0.053	0.145	0.123	0.124	0.403	0.262	0.163
Outcome Mean	35.71	0.286	0.222	0.294	0.300	0.639	0.564	0.212
Ethnicity F.E.	YES	YES	YES	YES	YES	YES	YES	YES
Controls	YES	YES	YES	YES	YES	YES	YES	YES
				Panel B. universe of partitioned members				
treated	-23.552***	0.113***	0.116***	0.237***	0.177***	0.225***	0.108***	0.137***
	(1.080)	(0.019)	(0.018)	(0.022)	(0.037)	(0.030)	(0.038)	(0.035)
Observations	14,659	14,700	14,736	14,743	14,770	14,758	14,637	14,660
R-squared	0.204	0.049	0.183	0.133	0.166	0.378	0.299	0.285
Outcome Mean	32.19	0.319	0.286	0.315	0.343	0.680	0.591	0.275
Ethnicity F.E.	YES	YES	YES	YES	YES	YES	YES	YES
Controls	YES	YES	YES	YES	YES	YES	YES	YES

The table displays the RD estimates of the disparities in socioeconomic outcomes across democratic (treated) and nondemocratic partitions. Economic insecurity is a standardized measure (0–100) assessing the frequency with which people face shortages of food, water, cooking fuel, medical treatment, and cash income. Subjective wellbeing is a dummy equal to one if a person rates their present living conditions as fairly or very good. Education equals to one if a person has completed a minimum secondary education, and employed is also equals to one if a person is waged employed. In columns (5)–(8) the dependent variable equals one if the stated public good is within walking distance from the respondent. All specifications include ethnicity and survey round fixed effects. The controls are respondent's age and its square, gender, and type of place of residence (rural/urban). Standard errors are clustered at the town/village. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

VI. Conclusion

Africa's wave of democratization in the early 1990s was one of the most consequential political transformations of the twentieth century, raising hopes that accountable governance would deliver the sustained economic growth and broad-based development that decades of authoritarian rule had failed to produce. This paper provides the first comprehensive causal investigation of whether those hopes were realized, combining national-level panel analysis with a subnational natural experiment that exploits Africa's colonial borders to compare otherwise similar communities living under different political regimes.

Across three levels of analysis (national income, subnational nighttime lights, and individual socioeconomic outcomes), the findings point consistently in one direction: Africa's wave of democratization generated substantial and lasting gains in economic performance and human development. At the national level, a full improvement in the liberal democracy index from 0 to 1 corresponds to a 13 percent income gain, while a transition from nondemocracy to democracy is associated with a 1.2 percent increase in income per person. These gains

operate through improvements in physical capital accumulation, trade openness, human capital formation, and economic liberalization, and they persist after accounting for the Structural Adjustment Programs that coincided with the democratization wave.

While the national-level estimates are informative, panel fixed effects models cannot fully rule out the possibility that unobserved time-varying factors are driving the observed income gains. National income averages also mask how development gains are distributed across space and whether they translate into improvements in the lived conditions of ordinary people. To address both concerns, the second part of the analysis leverages Africa's colonial borders, which arbitrarily divided ethnically homogeneous communities across what became consolidated democracies on one side and nondemocracies on the other. Because these partitioned groups share common ancestry, language, geography, and historical trajectory, any systematic differences in development that emerge across their shared border can be credibly attributed to differences in political regime.

Within this framework, grid cell panel fixed effects estimates show that democratization has strong positive effects on local development. A full-range increase in the liberal democracy index raises the probability that a grid cell has nighttime light by 16 percentage points (pp), while being under a democratic regime as opposed to a nondemocratic one increases this probability by 3.5 pp.

To sharpen the causal interpretation, I complement these estimates with a geographic regression discontinuity (RD) design that compares development outcomes on either side of each regime-dividing border over time, holding ethnic identity constant. The RD estimates reveal a striking pattern of divergence. Democratic and nondemocratic partitions were at comparable development levels in the early 1990s. But from the mid-1990s onward, nighttime light intensity began rising faster on the democratic side, and the gap widened steadily and persistently over time. By 2013, grid cells on the democratic side were 7 pp more likely to have light at night than their nondemocratic counterparts, representing a 37 percent increase relative to the sample mean. At the individual level, residents of democratic partitions report substantially lower economic insecurity, higher subjective wellbeing, greater educational attainment, higher rates of waged employment, and significantly better access to public infrastructure.

Appendix B provides two additional pieces of evidence. The first is a focused case study of the Ghana-Togo border that exploits the stark contrast between Ghana's sustained democratic transition and Togo's persistent autocratic rule. Comparing birth cohorts on either side of the border before and after Ghana's 1992 democratic transition reveals meaningful improvements in educational outcomes on the Ghanaian side compared to the Togo side. The second is a falsification test using a placebo border that no longer separates different political regimes, which finds no systematic development discontinuities. This confirms that the gaps documented in the main analysis reflect the consequences of political regime rather

than pre-existing geographic or historical differences.

References

Acemoglu, D., Naidu, S., Restrepo, P., and Robinson, J. A. (2019). Democracy does cause growth. *Journal of political economy*, 127(1):47–100.

Adam, A., Delis, M. D., and Kammas, P. (2011). Are democratic governments more efficient? *European Journal of Political Economy*, 27(1):75–86.

Aixalá, J. and Fabro, G. (2009). Economic freedom, civil liberties, political rights and growth: a causality analysis. *Spanish Economic Review*, 11:165–178.

Alesina, A., Easterly, W., and Matuszeski, J. (2011). Artificial states. *Journal of the European Economic Association*, 9(2):246–277.

Asiwaju, A. (1985). The conceptual framework. In Asiwaju, A., editor, *Partitioned Africans: Ethnic Relations Across Africa's International Boundaries, 1884-1984*, pages 1884–1984. C. Hurst, London.

Barro, R. J. (1999). Determinants of democracy. *Journal of Political economy*, 107(S6):S158–S183.

Bates, R. H. (2006). Institutions and development. *Journal of African economies*, 15(suppl_1):10–61.

Bates, R. H. (2010). Democracy in africa: A very short history. *Social Research: An International Quarterly*, 77(4):1133–1148.

Bates, R. H., Fayad, G., and Hoeffler, A. (2012). The state of democracy in sub-saharan africa. *International Area Studies Review*, 15(4):323–338.

Billmeier, A. and Nannicini, T. (2013). Assessing economic liberalization episodes: A synthetic control approach. *Review of Economics and Statistics*, 95(3):983–1001.

Bratton, M. and Van de Walle, N. (1997). *Democratic experiments in Africa: Regime transitions in comparative perspective*. Cambridge University Press.

Carbone, G. M., Memoli, V., and Quartapelle, L. (2016). Are lions democrats? the impact of democratization on economic growth in africa, 1980–2010. *Democratization*, 23(1):27–48.

Cattaneo, M. D., Idrobo, N., and Titiunik, R. (2019). *A practical introduction to regression discontinuity designs: Foundations*. Cambridge University Press, Cambridge.

Collier, P., Bates, R. H., Hoeffler, A., and O'Connell, S. A. (2007). Endogenizing syndromes. In Ndulu, B. J., O'Connell, S. A., Bates, R. H., Collier, P., and Soludo, C. C., editors, *The Political Economy of Economic Growth in Africa, 1960-2000*, volume 1, pages 392–418. Cambridge University Press.

Coppedge, M., Lindberg, S., Skaaning, S.-E., and Teorell, J. (2016). Measuring high level democratic principles using the v-dem data. *International Political Science Review*, 37(5):580–593.

De Kadt, D. and Wittels, S. B. (2019). Democratization and economic output in sub-saharan africa. *Political Science Research and Methods*, 7(1):63–84.

Deacon, R. T. (2009). Public good provision under dictatorship and democracy. *Public choice*, 139:241–262.

Dell, M. (2010). The persistent effects of peru's mining mita. *Econometrica*, 78(6):1863–1903.

Dimico, A. (2017). Size matters: the effect of the size of ethnic groups on development. *Oxford Bulletin of Economics and Statistics*, 79(3):291–318.

Dorn, D., Fischer, J. A., Kirchgässner, G., and Sousa-Poza, A. (2007). Is it culture or democracy? the impact of democracy and culture on happiness. *Social Indicators Re-*

search, 82:505–526.

Doucouliagos, C. and Ulubasoglu, M. A. (2006). Economic freedom and economic growth: Does specification make a difference? *European journal of political economy*, 22(1):60–81.

Englebert, P. (2000). *State Legitimacy and Development in Africa*. Lynne Rienner Publishers, Boulder, CO.

Englebert, P., Tarango, S., and Carter, M. (2002). Dismemberment and suffocation: A contribution to the debate on african boundaries. *Comparative political studies*, 35(10):1093–1118.

Fan, J. and Gijbels, I. (1996). *Local polynomial modelling and its applications: monographs on statistics and applied probability 66*. Chapman & Hall, London.

Feng, Y. (1996). Democracy and growth: The sub-saharan african case, 1960-1992. *The Review of Black Political Economy*, 25(1):95–126.

Fetzer, T., Henderson, V., Nigmatulina, D., and Shanghavi, A. (2016). What happens to cities when countries become democratic. *Unpublished, University of Warwick and London School of Economics*.

Forrest, J. B. (1988). The quest for state" hardness" in africa. *Comparative Politics*, 20(4):423–442.

Fosu, A. K. (2008). Democracy and growth in africa: Implications of increasing electoral competitiveness. *Economics Letters*, 100(3):442–444.

Gelman, A. and Imbens, G. (2019). Why high-order polynomials should not be used in regression discontinuity designs. *Journal of Business & Economic Statistics*, 37(3):447–456.

Goldsmith, A. A. (2001). Donors, dictators and democrats in africa. *The Journal of Modern African Studies*, 39(3):411–436.

Gwartney, J., Lawson, R., and Murphy, R. (2023). Economic freedom of the world: 2023 annual report. Technical report, Fraser Institute.

Gyimah-Boadi, E. (2015). Africa's waning democratic commitment. *Journal Democracy*, 26:101.

Harding, R. (2020). Who is democracy good for? elections, rural bias, and health and education outcomes in sub-saharan africa. *The Journal of Politics*, 82(1):241–254.

Harding, R. and Stasavage, D. (2014). What democracy does (and doesn't do) for basic services: School fees, school inputs, and african elections. *The Journal of Politics*, 76(1):229–245.

Henderson, J. V., Storeygard, A., and Weil, D. N. (2012). Measuring economic growth from outer space. *American economic review*, 102(2):994–1028.

Herbst, J. (2000). *States and power in Africa: Comparative lessons in authority and control*. Princeton University Press, Princeton, NJ.

Huntington, S. P. (1991). *The Third Wave: Democratization in the Late Twentieth Century*, volume 4. University of Oklahoma Press.

Judson, R. A. and Owen, A. L. (1999). Estimating dynamic panel data models: a guide for macroeconomists. *Economics letters*, 65(1):9–15.

Keele, L. J. and Titiunik, R. (2015). Geographic boundaries as regression discontinuities. *Political Analysis*, 23(1):127–155.

Khodaverdian, S. (2021). The african tragedy: the effect of democracy on economic growth. *Empirical Economics*, 62(3):1147–1175.

Kiviet, J. F. (1995). On bias, inconsistency, and efficiency of various estimators in dynamic

panel data models. *Journal of econometrics*, 68(1):53–78.

Knutsen, C. H. (2013). Democracy, state capacity, and economic growth. *World development*, 43:1–18.

Kudamatsu, M. (2012). Has democratization reduced infant mortality in sub-saharan africa? evidence from micro data. *Journal of the European Economic Association*, 10(6):1294–1317.

Lewis, P. (2008). Growth without prosperity in africa. *Journal of Democracy*, 19:95.

Lipset, S. M. (1959). Some social requisites of democracy: Economic development and political legitimacy1. *American political science review*, 53(1):69–105.

Martinez, L. R. (2022). How much should we trust the dictator's gdp growth estimates? *Journal of Political Economy*, 130(10):2731–2769.

Masaki, T. and van de Walle, N. (2015). The impact of democracy on economic growth in sub-saharan africa, 1982–2012. In Monga, C. and Yifu Lin, J., editors, *The Oxford Handbook of Africa and Economics*, volume 1: Context and Concepts, page 659–674. Oxford University Press.

Mattes, R. (2019). Democracy in africa: Demand, supply and the dissatisfied democrat. Policy Paper Issue 54, Afrobarometer.

Michalopoulos, S. and Papaioannou, E. (2014). National institutions and subnational development in africa. *The Quarterly journal of economics*, 129(1):151–213.

Michalopoulos, S. and Papaioannou, E. (2016). The long-run effects of the scramble for africa. *American Economic Review*, 106(7):1802–48.

Müller-Crepon, C., Schvitz, G., and Cederman, L.-E. (2023). Shaping states into nations: The effects of ethnic geography on state borders. *American Journal of Political Science*.

Murdock, G. P. (1959). *Africa: its peoples and their culture history*. McGraw-Hill Book Company, New York.

Ndulu, B. J. and O'Connell, S. A. (1999). Governance and growth in sub-saharan africa. *Journal of Economic Perspectives*, 13(3):41–66.

Nickell, S. (1981). Biases in dynamic models with fixed effects. *Econometrica: Journal of the econometric society*, pages 1417–1426.

Nkurunziza, J. and Bates, R. (2003). Political institutions and economic growth in africa. CSAE WPS 2003-03, Centre for the Study of African Economies, Oxford.

Paine, J., Qiu, X., and Ricart-Huguet, J. (2024). Endogenous colonial borders: Precolonial states and geography in the partition of africa. *American Political Science Review*, pages 1–20.

Papaioannou, E. and Siourounis, G. (2008). Democratisation and growth. *The Economic Journal*, 118(532):1520–1551.

Powell, J. M. and Thyne, C. L. (2011). Global instances of coups from 1950 to 2010: A new dataset. *Journal of Peace Research*, 48(2):249–259.

Rode, M. and Gwartney, J. D. (2012). Does democratization facilitate economic liberalization? *European Journal of Political Economy*, 28(4):607–619.

Sandbrook, R. (1996). Democratization and the implementation of economic reform in africa. *Journal of International Development*, 8(1):1–20.

Schiel, R. E., Wilson, B. M., Langford, M., and Faulkner, C. M. (2023). Democracy and public goods revisited: Local institutions, development, and access to water. *The British Journal of Politics and International Relations*, 25(2):237–259.

Stasavage, D. (2005). Democracy and education spending in africa. *American journal of*

political science, 49(2):343–358.

Tiruneh, G. (2006). Regime type and economic growth in africa: A cross-national analysis. *The Social Science Journal*, 43(1):3–18.

Van de Walle, N. (1999). Economic reform in a democratizing africa. *Comparative Politics*, pages 21–41.

Wilén, N. (2024). Contagious coups in africa? history of civil–military imbalance. *African Affairs*, 123(491):243–261.

Appendix

A Tables and Figures

Appendix Table A1: Democratic-Nondemocratic Partitions

Ethnic Group	Countries Split Into	Democratic Partition (%)
Adele	Ghana (48 %), Togo (52 %)	48 %
Ambo	Angola (41 %), Namibia (59 %)	59 %
Ana	Togo (66.7 %), Benin (33.3 %)	33.3 %
Anyi	Côte d'Ivoire (58.3 %), Ghana (4241.7 %)	41.7 %
Assini	Côte d'Ivoire (46 %), Ghana (49 %)	49 %
Atyuti	Togo (87 %), Ghana (13 %)	13 %
Avatime	Togo (48.6 %), Ghana (51.4 %)	51.4 %
Bargu	Niger (2.6 %), Nigeria (19 %), Burkina Faso (1.8 %), Benin (76.6 %)	76.6 %
Birifon	Burkina Faso (48 %), Ghana (52 %)	52 %
Brong	Côte d'Ivoire (15.7 %), Ghana (84.3 %)	84.3 %
Buem	Togo (60 %), Ghana (40 %)	40 %
Busa	Nigeria (86 %), Benin (14 %)	14 %
Busansi	Togo (3.6 %), Burkina Faso (90.6 %), Ghana (5.5 %)	5.5 %
Chakossi	Togo (73.4 %), Ghana (26.6 %)	26.6 %
Dagari	Burkina Faso (33 %), Ghana (67 %)	67 %
Dagomba	Togo (7.5 %), Ghana (92.5 %)	92.5 %
Dendi	Niger (38.5 %), Nigeria (0.8 %), Benin (60.8 %)	60.8 %
Egba	Nigeria (51.8 %), Togo (7.6 %), Benin (40.5 %)	40.5 %
Ewe	Togo (55.5 %), Ghana (42 %)	42 %
Fon	Togo (14.3 %), Nigeria (0.15 %), Benin (85 %)	85 %
Grunshi	Burkina Faso (32 %), Ghana (68 %)	68 %
Gun	Nigeria (50 %), Benin (46.5 %)	46.5 %
Gurensi	Burkina Faso (13 %), Togo (13 %), Ghana (74 %)	74 %
Gurma	Togo (1 %), Burkina Faso (72 %), Niger (12 %), Benin (15 %)	15 %
Herero	Angola (9 %), Namibia (91 %)	91 %
Hiechware	Zimbabwe (19.4 %), Botswana (80.6 %)	80.6 %
Kabre	Togo (62 %), Benin (38 %)	38 %
Konkomba	Togo (76 %), Ghana (24 %)	24 %
Kwangare	Angola (84 %), Namibia (16 %)	16 %
Ligbi, Degha (Se)	Côte d'Ivoire (28.5 %), Ghana (71.5 %)	71.5 %
Mbukushu	Angola (73.7 %), Namibia (11.6 %), Botswana (14.7 %)	26.3 %
Nafana	Côte d'Ivoire (26.3 %), Ghana (73.7 %)	73.7 %
Naudeba	Togo (16 %), Benin (84 %)	84 %
Ndebele	Zimbabwe (94.6 %), Botswana (5.6 %)	5.6 %
Nukwe	Zambia (5.2 %), Angola (44.2 %), Botswana (24.3 %), Namibia (26.4 %)	50.6 %
Popo	Togo (28.5 %), Benin (63.5 %)	63.5 %
Ronga	Mozambique (59.5 %), Eswatini (5.3 %), South Africa (34.7 %)	71.5 %
Sotho	Lesotho (23.8 %), South Africa (76.2 %)	76.2 %
Subia	Zambia (52.7 %), Zimbabwe (6.1 %), Botswana (11 %), Namibia (30.1 %)	41.2 %
Swazi	Eswatini (55.5 %), South Africa (44.5 %)	44.5 %
Tem	Togo (82.7 %), Benin (17.3 %)	17.3 %
Thonga	Mozambique (58.3 %), South Africa (41.7 %)	41.7 %
Tlokwa	Zimbabwe (8.5 %), Botswana (14.3 %), South Africa (77.2 %)	91.5 %
Tribu	Togo (75.5 %), Ghana (24.5 %)	24.5 %
Venda	Zimbabwe (30.6 %), South Africa (69.4 %)	69.4 %

The table shows the major democratic-nondemocratic partitions used in the analysis.

Appendix Table A2: Border Discontinuities in Demographics

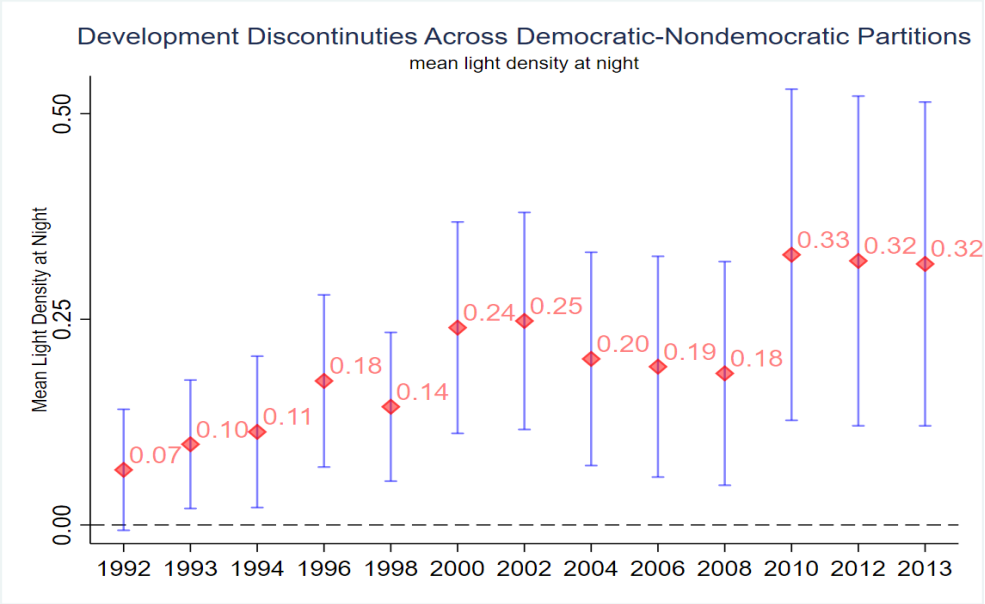
	50 km			100 km		
	age	female	rural	age	female	rural
treated	-0.260	-0.001	0.1003***	-1.571*	0.007	0.288***
	(0.609)	(0.022)	(0.021)	(0.855)	(0.031)	(0.030)
Obs.	6,989	7,022	7,022	10,231	10,275	10,275
R-sq.	0.003	0.000	0.016	0.004	0.000	0.034

The table displays estimates testing the discontinuities in predetermined covariates across democratic-nondemocratic partitions. The "treated" refers to the democratic side of the border. Robust standard errors are reported in parenthesis below the estimates. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

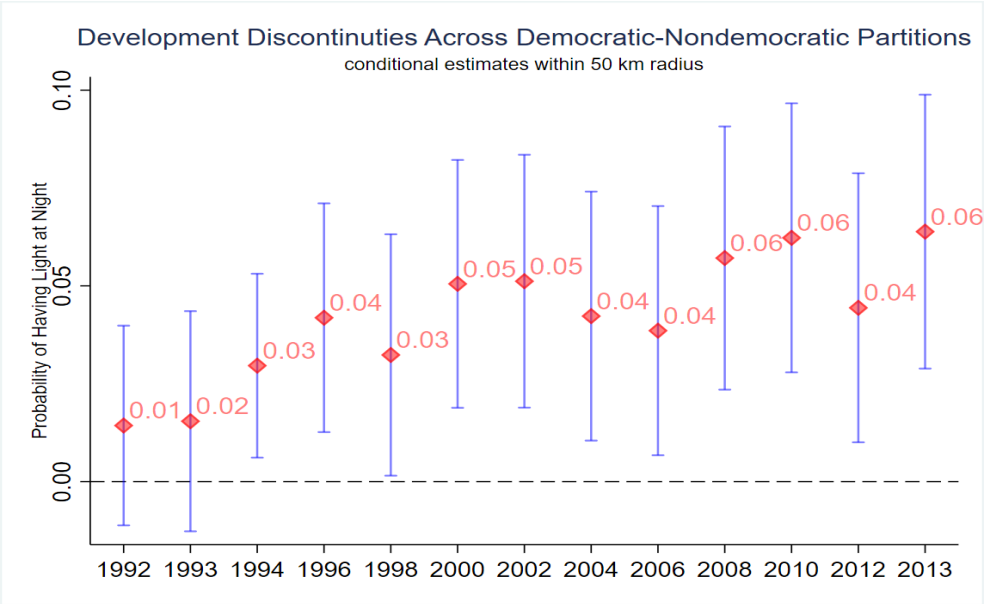
Appendix Table A3: Sensitivity Checks

	1996	1998	2000	2002	2004	2006	2008	2010	2012	2013
					Panel A. Two Dimensional RD					
treated	0.042***	0.039***	0.055***	0.057***	0.051***	0.048***	0.069***	0.074***	0.055***	0.073***
	(0.014)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.016)	(0.016)	(0.017)	(0.017)
Obs.	6,562	6,562	6,562	6,562	6,562	6,562	6,562	6,562	6,562	6,562
R-squared	0.243	0.242	0.280	0.262	0.264	0.233	0.249	0.271	0.273	0.239
					Panel B. Ethnicity-Specific Slopes					
treated	0.036**	0.037**	0.047***	0.047***	0.045***	0.041**	0.064***	0.073***	0.056***	0.075***
	(0.015)	(0.016)	(0.016)	(0.017)	(0.016)	(0.016)	(0.017)	(0.018)	(0.018)	(0.018)
Obs.	6,562	6,562	6,562	6,562	6,562	6,562	6,562	6,562	6,562	6,562
R-squared	0.258	0.262	0.306	0.282	0.289	0.255	0.277	0.296	0.292	0.257
					Panel C. Optimal MSE Bandwidth Estimators					
Conventional	0.035**	0.034**	0.032*	0.038*	0.043**	0.043**	0.064***	0.066***	0.054***	0.070***
	(0.016)	(0.017)	(0.019)	(0.020)	(0.018)	(0.018)	(0.019)	(0.020)	(0.020)	(0.020)
Bias-corrected	0.036**	0.034**	0.026	0.032	0.042**	0.043**	0.065***	0.067***	0.057***	0.075***
	(0.016)	(0.017)	(0.019)	(0.020)	(0.018)	(0.018)	(0.019)	(0.020)	(0.020)	(0.020)
Robust	0.036*	0.034*	0.026	0.032	0.042*	0.043**	0.065***	0.067***	0.057**	0.075***
	(0.019)	(0.020)	(0.022)	(0.023)	(0.022)	(0.022)	(0.023)	(0.024)	(0.024)	(0.024)
Obs.[L R]	6146 8685	6146 8685	6146 8685	6146 8685	6146 8685	6146 8685	6146 8685	6146 8685	6146 8685	6146 8685
Eff. N.[L R]	2965 3010	2976 3019	2562 2566	2454 2479	2822 2912	2838 2948	2826 2923	2796 2871	2816 2890	2800 2879
Eff. Bias N.[L R]	4035 4223	4026 4177	3896 4014	3783 3909	3978 4103	3948 4069	3931 4056	3910 4033	3930 4056	3943 4066

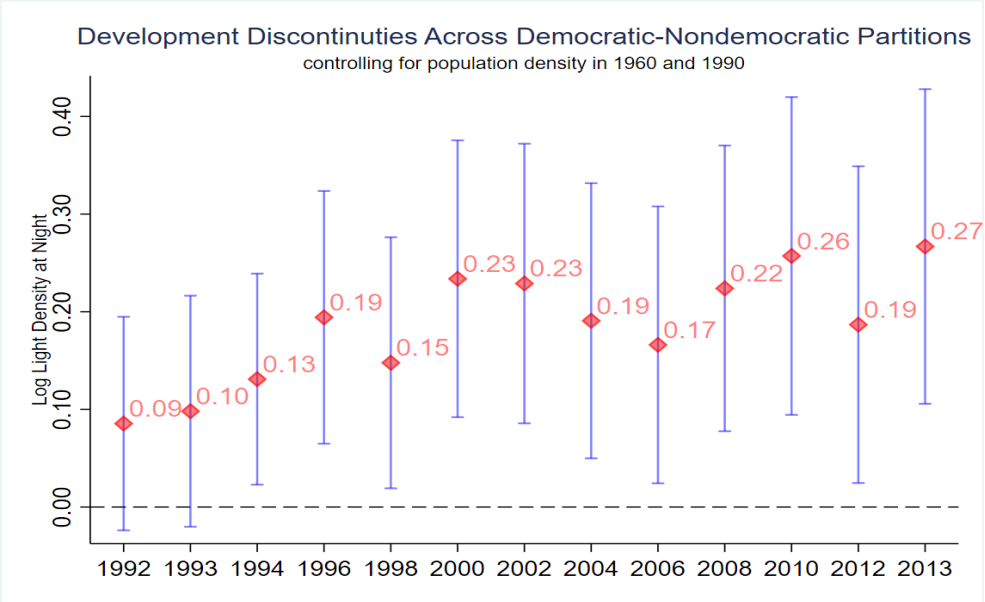
The table displays the results from the sensitivity checks of the baseline results showing the development disparities across democratic-nondemocratic partitions. The model in Panel A uses a two dimensional RD whereas the one in Panel B assigns unique slopes to each partitioned ethnicity along a border. Panel C estimates the disparities using optimal MSE bandwidth estimators with a triangular kernel. The dependent variable takes a value one if a grid cell has light and zero otherwise. All specifications include ethnicity fixed effects. To fit results into the page, estimates before 1996 are not shown. Standard errors are clustered at the grid cell. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$



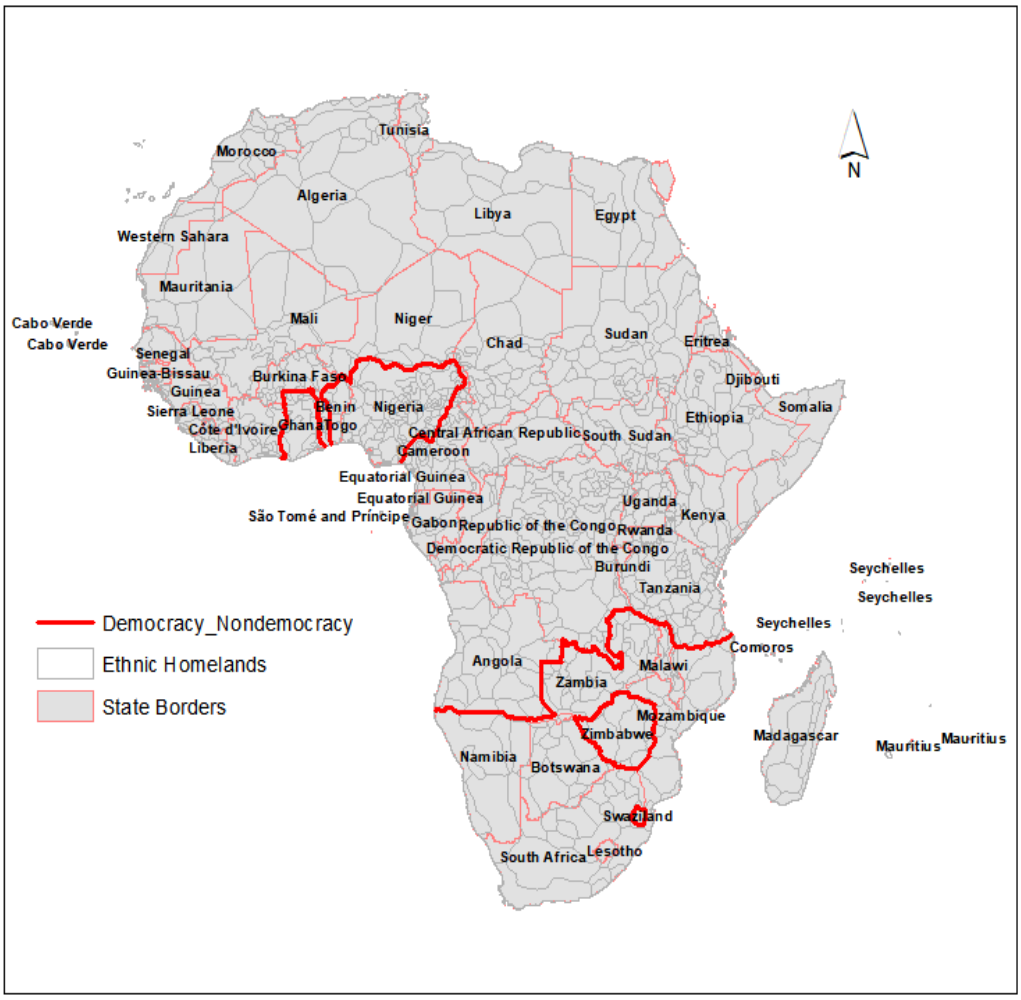
Appendix Figure A1: The figure shows RD estimates of development discontinuities across democratic-nondemocratic partitions using mean light density at night as the dependent variable. Standard errors are clustered at the grid cell.



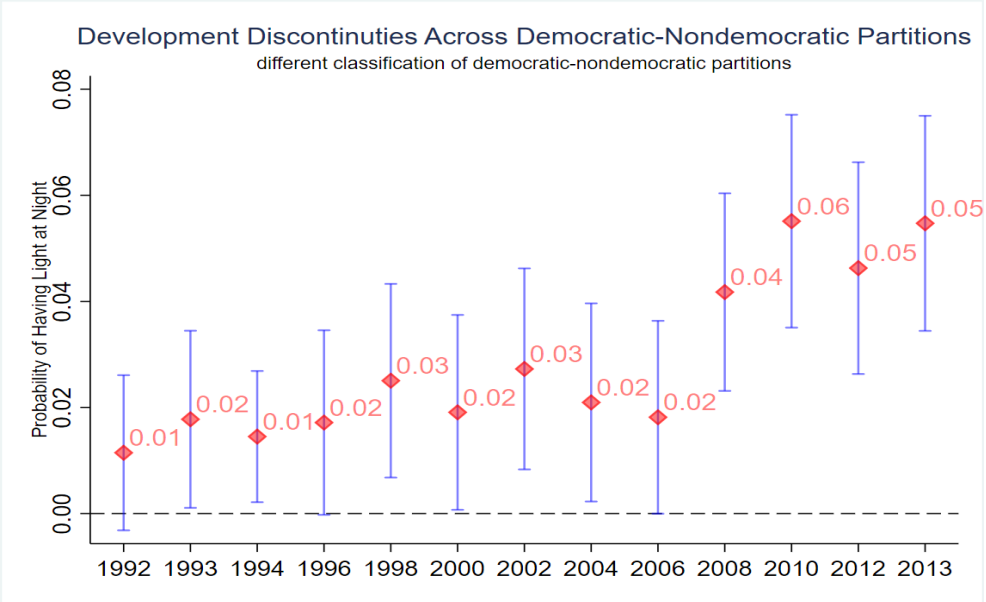
Appendix Figure A2: The figure shows conditional RD estimates of development discontinuities across democratic-nondemocratic partitions, controlling for distance to river, seacoast, mean elevation, precipitation, slope, and grid cell size. Standard errors are clustered at the grid cell.



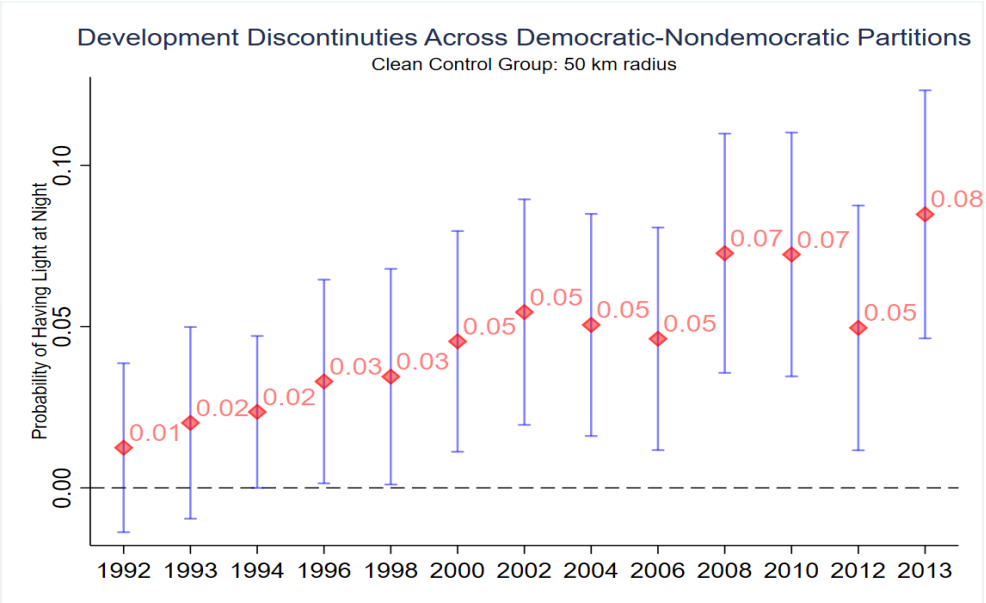
Appendix Figure A3: The figure shows RD estimates of development discontinuities controlling for log population densities in 1960 and 1990, where the dependent variable is log light density ($\ln y = \ln(0.01+$ mean light$)$). Standard errors are clustered at the grid cell.



Appendix Figure A4: The figure displays ethnic homelands and contemporary state borders dividing ethnicities into democracies and nondemocracies under a weaker classification of consolidated democracy.



Appendix Figure A5: The figure shows RD estimates of development discontinuities across democratic-nondemocratic partitions using a weaker classification of consolidated democracy, where the dependent variable equals one if the grid cell has light and zero otherwise. Standard errors are clustered at the grid cell.



Appendix Figure A6: The figure shows RD estimates of development discontinuities across democratic-nondemocratic partitions after restricting the control group to countries that failed both the strict democracy criterion and the liberal democracy threshold. The dependent variable equals one if the grid cell has light at night and zero otherwise. Standard errors are clustered at the grid cell.

B Further Evidence & Falsification Analysis

This appendix provides two additional pieces of evidence that complement the main findings and strengthen their causal interpretation. The first is a focused case study of the Ghana-Togo border, which exploits the stark contrast between Ghana's sustained democratic transition and Togo's persistent autocratic rule to examine the long-run human development consequences of democratization. The second is a falsification test using a placebo border that no longer separates communities under different political regimes, which assesses whether the development disparities documented in the main analysis reflect the consequences of political regime or pre-existing geographic, historical, or cultural differences.

The Ghana-Togo border presents an ideal setting for this analysis. Both countries followed similar political trajectories until 1992, when Ghana successfully transitioned to democracy and has sustained it since, while Togo remained under autocratic rule. This divergence is clearly captured by the libdem index. Ghana's libdem score rose from 0.097 in 1990 to 0.630 in 2018, the most significant improvement across the continent, while Togo's score increased only marginally from 0.067 to 0.242 (see Figure B1). Even using the binary democracy classification, Figure 7b in the main text shows that Togo did not experience a single democratic episode throughout our sample period.

Beyond their divergent political paths, the Ghana-Togo border is also relatively arbitrary in its placement, partitioning approximately 15 ethnic groups including 11 major partitions. These groups also vary considerably in their internal political arrangements. Some, like the Dagomba and Mamprussi, have centralized kingdoms, while others, like the Konkomba, lack formal hierarchical structures. This diversity across partitioned groups reduces concerns that the findings are driven by some homogeneous or distinct characteristics of the groups along this border, and provides a more general test of whether democratization's effects persist across different sociopolitical contexts.

B.I Democratization and Human Development

To evaluate the impact of democratization on human capital outcomes, I focus on access to formal education and years of schooling. Access to formal education is measured as a binary indicator equal to one if a respondent has any level of formal education and zero otherwise. Years of schooling refers to the total number of completed school years.

I use the 2014 Demographic and Health Survey (DHS) household member recode for data on access to education and years of schooling. The sample covers individuals aged 12 and older. Individuals younger than 12 are excluded because they were likely still completing their primary education at the time of the survey, making their educational attainment measures incomplete and unreliable.

The identification strategy exploits a comparison of birth cohorts on either side of the

Ghana-Togo border before and after Ghana's democratic transition in 1992. The core idea is that if democratization improves human development, then educational outcomes should improve for post-transition cohorts on the Ghanaian side relative to their Togolese counterparts. Critically, this relative improvement should not be evident among cohorts born before the transition, when both sides were operating under similar political conditions.

The analysis covers five cohort groups, namely pre-1963, 1963-1972, 1973-1982, 1983-1992, and 1993-2002.[11] Rather than pooling all cohorts in a single regression, I estimate separate regressions for each cohort group. This approach avoids assumptions about functional form or time trends and allows for a clean, flexible comparison of average educational differences between the Ghanaian and Togolese sides within each cohort. In the specification, I control for gender, marital status, and place of residence, and include ethnicity fixed effects to ensure that comparisons are made between individuals of the same ethnicity, born in the same decade, but raised under different political regimes as a consequence of the border.

Figures B2a and B2b display the estimated educational disparities across the Ghana-Togo border by birth cohort. A clear and consistent pattern emerges from the results. For cohorts born before Ghana's democratic transition, the differences in educational outcomes between the Ghanaian and Togolese sides are small and statistically insignificant, suggesting no long-standing structural advantage on either side of the border. For the 1993-2002 cohort, who were born after the transition, individuals on the Ghanaian side are 7 percentage points (pp) more likely to have received formal education and have completed over one additional year of schooling on average. Put differently, the educational gap emerges precisely with the generation that came of age under democratic governance, and is absent among those who grew up before it.

The fact that the educational advantage emerges only after Ghana's democratic transition and is entirely absent among pre-transition cohorts provides compelling evidence that democracy itself, rather than pre-existing structural differences between the two sides, is driving the observed gains. This finding is consistent with prior work showing that democratic governments in Africa are more likely to invest in education, including abolishing school fees and expanding access to formal schooling (Harding and Stasavage, 2014; Stasavage, 2005).

B.II Falsification Analysis

To reinforce the causal interpretation of the main findings, I implement a falsification test using a placebo border. The placebo border is the historical boundary that once divided the British-controlled Gold Coast and German Togoland. As shown in Figure B3, this boundary (shown in blue) existed from 1884 to 1914, when Germany lost its colonial possessions following World War I. The German Togoland territory was subsequently divided

[11] The pre-1963 cohorts are grouped together due to small sample sizes.

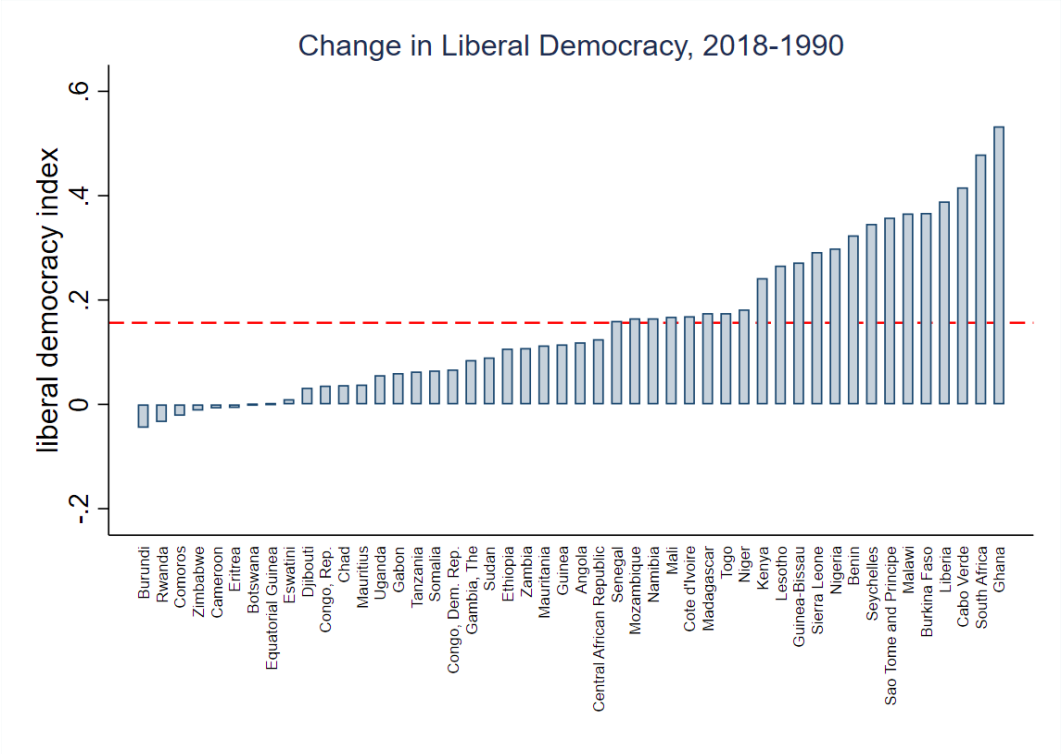
between Great Britain and France, producing British Togoland and French Togoland. Upon independence, British Togoland merged with the Gold Coast to form modern Ghana, while French Togoland became present-day Togo. The current Ghana–Togo border is shown with the red line in the figure.

The logic of the falsification test is straightforward. The main analysis attributes development disparities across democratic-nondemocratic ethnic partitions to the fact that one side sustained its democratic transition from the mid-1990s while the other did not. If this interpretation is correct, then a border that no longer separates communities under different political regimes should produce no systematic development differences. Both sides of the Gold Coast–British Togoland boundary have been governed by Ghana's democratic institutions since the mid-1990s, making it an ideal placebo. If significant discontinuities are nonetheless observed across this border, it would suggest that factors other than political regime are driving the main results.

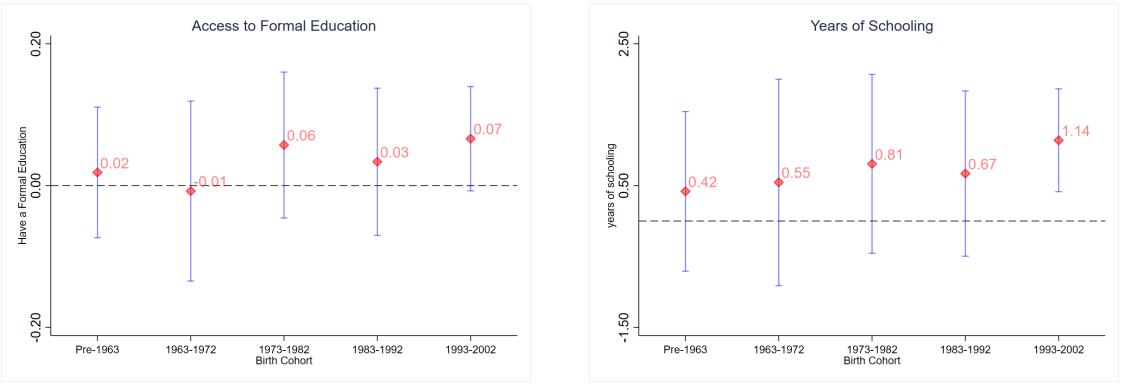
I restrict this analysis to ethnic groups straddling the now-defunct Gold Coast–British Togoland border. Ten ethnic groups cross this boundary, five of which – namely the Dagomba, Ewe, Gurensi, Krachi, and Mamprusi – qualify as major partitions. Following the same sample restriction applied in the main analysis, I focus on these major partitions to reduce measurement error from minor boundary overlaps due to digitizing and to ensure that the ethnic groups examined are sufficiently inhabited and economically relevant on both sides of the placebo border.

The falsification results are presented in Figure B4, with the former Gold Coast as the treated side and the former British Togoland as the control. The estimates show no systematic differences in development outcomes across this historical boundary. Nearly all coefficient estimates are small, centered around zero, and statistically insignificant throughout the sample period.

The absence of development disparities along the Gold Coast–British Togoland border provides strong validation for the main analysis. It confirms that the development divergence documented across democratic-nondemocratic ethnic partitions is driven by post-independence differences in political regime rather than by pre-existing geographic, historical, or cultural characteristics. Taken together with the Ghana–Togo case study, these results reinforce the paper's central conclusion that Africa's wave of democratization, where it consolidated into genuine and sustained democratic governance, generated lasting and meaningful gains in development.

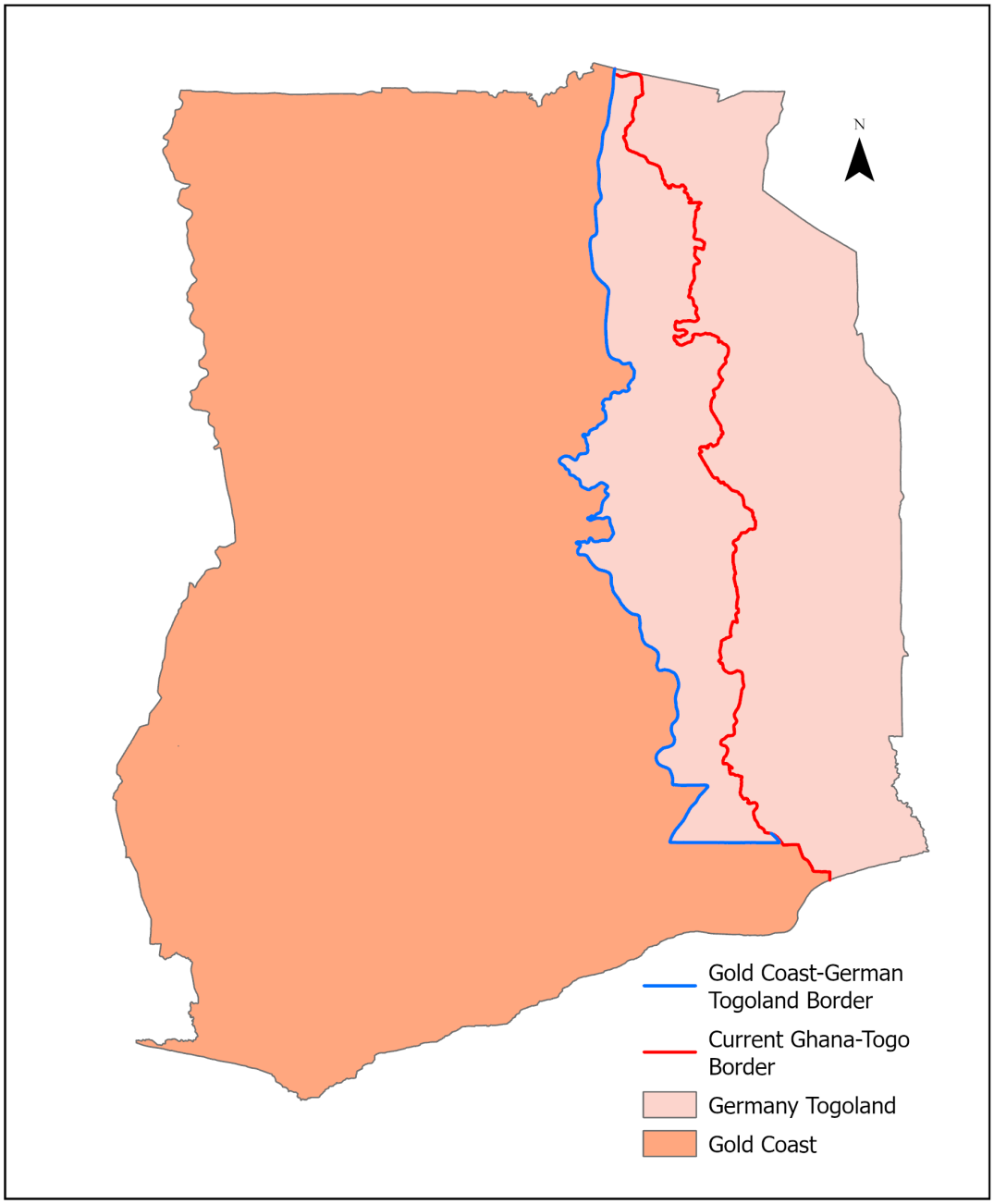


Appendix Figure B1: The figure shows country-level changes in the Liberal Democracy Index from 1990 to 2018.

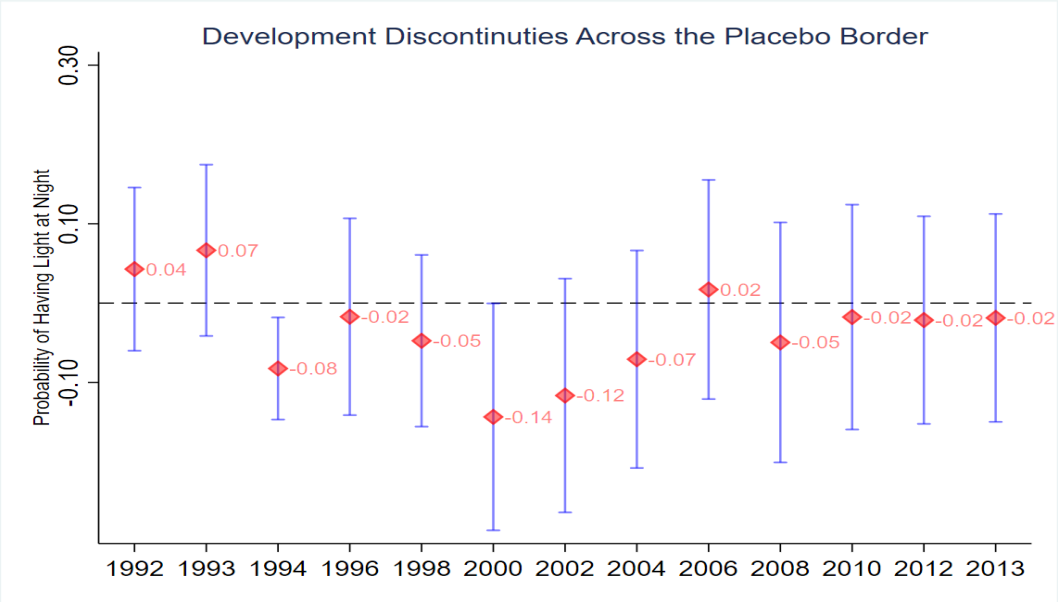


(a) (b)

Appendix Figure B2: The figures display disparities in human capital across the Ghana-Togo border within a 50 km radius, where the left panel uses access to formal education as the dependent variable and the right panel uses years of schooling. All specifications include ethnicity fixed effects and controls for place of residence and gender, with standard errors clustered at the survey sampling unit.



Appendix Figure B3: The figure shows the Gold Coast (dark orange) and German Togoland (light orange). The blue line depicts the historical Gold Coast–German Togoland border used as the placebo in the falsification test. The red line shows the current Ghana–Togo border, which reflects the subsequent partition of German Togoland into British Togoland (merged with the Gold Coast to form Ghana) and French Togoland (present-day Togo).



Appendix Figure B4: The figure shows RD estimates of development discontinuities across the Gold Coast-British Togoland border, where the dependent variable equals one if the grid cell has light at night and zero otherwise. All models include ethnicity fixed effects and standard errors are clustered at the grid cell.