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

Idris Kambala *

Regularly updated. For the most recent version, click **here**.

Abstract

I investigate the long-run effects of Africa's 1990s democratization wave on economic performance and development. First, using a dynamic panel fixed effects model, I document a robust positive impact of democratization on income per capita. I find that being in a democratic regime – as opposed to a nondemocratic one – is associated with a 1.2 % higher income per capita, while a 10 % improvement on the liberal democracy index raises income per capita by 1.3 %. To isolate the *causal* impact of democratization on long-run development, I exploit African borders that partition historically and culturally homogeneous ethnic groups into present-day consolidated democracies and nondemocracies. In this exercise, I first present grid cell-level panel fixed effects estimates showing a robust positive impact of democratization on subnational development, measured by nighttime light density. I then employ a within-ethnicity geographic regression discontinuity design to compute the development disparities across democratic and nondemocratic partitions over time. I find that democratic and nondemocratic partitions were initially at similar levels of development, but democratic partitions experienced sustained development gains over time, leading to persistent divergence. By 2013, grid cells in democratic partitions were about 7 percentage points more likely to have light at night relative to their nondemocratic counterparts. Using individual-level survey data, I further show that democratization improves human development, particularly years of schooling, formal education access, and higher education completion, as well as other socioeconomic outcomes including economic security, employment, and access to public goods.

Keywords: Africa, democratization, economic performance, development, borders

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, 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

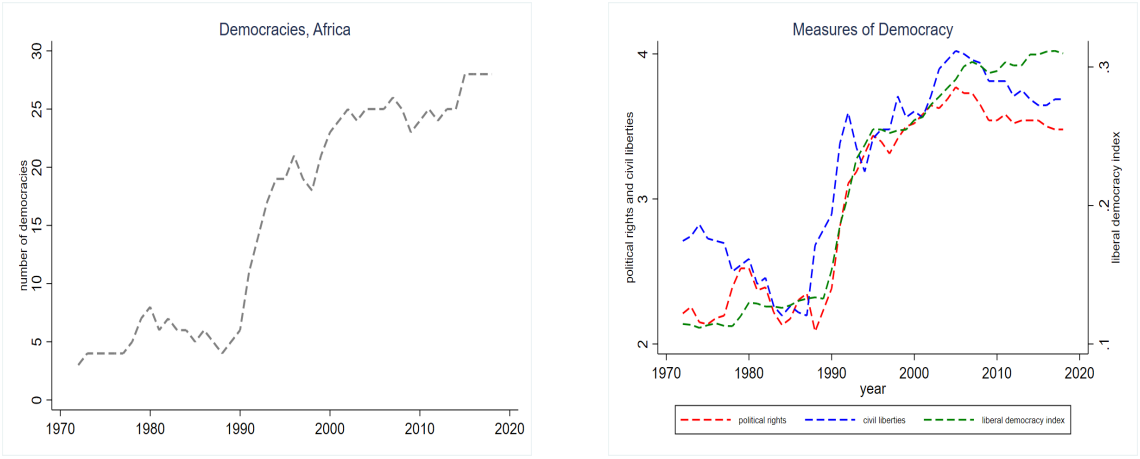
After gaining independence in the 1960s, many African countries went through several political phases. First, from the 1960s to the mid-1970s authoritarian rule took hold across most of the continent. In the following decade, these authoritarian governments struggled to manage growing economic crises. Then things took a dramatic turn in the early 1990s when a wave of democratization swept through Africa (Ndulu and O'Connell, 1999). This movement toward democracy was unprecedented. It shook the long-standing military, autocratic and one-party rule systems that had hitherto dominated Africa's political landscape. Between 1988 and 1994, the number of African countries allowing multiparty elections rose from just five to twenty-one. These elections were not nominal, as for the first time, many African nations saw opposition parties winning elections and peaceful transfers of power (Goldsmith, 2001). This wave resulted in the number of African democracies rising from just four in 1988/89 to nineteen in 1995, a development closely accompanied by immense improvements in political rights and civil liberties (see figures 1a and 1b). By 1994, Africa no longer had *de jure* one-party states (Bratton and Van de Walle, 1997).

This shift toward democracy brought hope not only for political freedoms but also for economic improvements. Many believed that democratic governance would help tackle the continent's persistent problems of poverty and underdevelopment by promoting accountability, reducing corruption, and fostering better economic policies (Bates, 2006; Collier et al., 2007; Sandbrook, 1996; Van de Walle, 1999). However, whether this wave of democratization has delivered on these economic promises remains an open question.

Motivated by this unresolved question, this study investigates whether Africa's wave of democratization improved economic performance and long-term development outcomes. While there is widespread agreement that authoritarian rule contributed to Africa's growth and development tragedy (Ake, 1996; Bates, 2010; Lewis, 2008; World Bank, 1989), the economic and development gains of democratization in the region remain insufficiently documented. This study addresses that gap by examining the economic and development impacts of Africa's wave of democratization, conducting both national and subnational analyses.

The relationship between democracy and economic development has long been a topical debate. On one hand, some scholars argue that democracy fosters economic growth by creating stable institutions, reducing corruption, and promoting investments in human capital and infrastructure (Acemoglu et al., 2019; Madsen et al., 2015; Papaioannou and Siourounis, 2008; Rodrik and Wacziarg, 2005). Further, democratic governments are more accountable to their citizens and more likely to adopt policies that promote long-term development. On the other hand, some argue that democracy has little to no impact on economic perfor-

mance, or that authoritarian regimes may be better at promoting growth by making decisive policy choices without the constraints of political opposition (Barro, 1996; Helliwell, 1994; Murtin and Wacziarg, 2014). This ongoing debate underscores the need for more context-specific research, particularly in regions like Africa, where historical and colonial legacies and institutional weaknesses continue to play a significant role in shaping development outcomes.



(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, which is defined as countries having a Polity2 score greater than zero and being classified as free or partly free by Freedom House. The right panel shows yearly performances in the liberal democracy index from V-Dem alongside civil liberties and political rights from Freedom House.

Differences in empirical findings on the democracy-development relationship stem from several methodological challenges. One key issue is that many studies model democracy as an immediate cause of economic growth, rather than considering it as a long-term process that accumulates over time (Gerring et al., 2005; Persson and Tabellini, 2009). Additionally, democratization itself may be influenced by past levels of economic development (Barro, 1999; Epstein et al., 2006; Lipset, 1959), or triggered by episodes of economic crisis (Acemoglu and Robinson, 2001; Brückner and Ciccone, 2011; Haggard and Kaufman, 1995). These dynamics raise concerns about endogeneity, making it difficult to isolate the causal impact of democratization on economic performance. In other words, democratizing and non-democratizing countries may be systematically different in ways that affect their growth trajectories.

My study mitigates these empirical challenges in several ways. First, concerns about democratic capital are less relevant in the African context, where most countries had little to no democratic history prior to the 1990s.[1] Second, the problem of systematic differences

[1]On the eve of the democratization wave, only three countries – Botswana, Gambia, and Mauritius – had

between democratizing and non-democratizing countries is also absent because Africa's democratization wave affected almost all countries. By the end of 1997, 44 out of 48 African countries had held some form of competitive, free, and fair national elections (Bratton, 1998).[2] Finally, to address concerns about pre-existing economic conditions, I adopt two strategies. First, I include autoregressive components in my panel fixed effects model to account for prior GDP dynamics, as suggested by Acemoglu et al. (2019). Second, I leverage Africa's colonial borders as a natural experiment, where I compare development outcomes between culturally and historically similar communities on either side of a border, where one side is democratic and the other is not.

I start the empirical analysis with a dynamic panel fixed effects model to estimate the national-level impact of democratization on economic performance. I then move to subnational-level analysis where I leverage the natural experiment offered by Africa's "arbitrary" borders. The subnational-level analysis provides more localized estimates by isolating the effect of democratization on communities with shared ethnic, cultural, and historical characteristics. Next, I provide a focused case study of the Ghana-Togo border to offer more granular evidence on the development impacts of democratization. Finally, I conduct a falsification analysis using a pseudo border to ensure that the observed effects are not driven by unrelated geographic or historical factors.

In the dynamic panel fixed effects analysis, I examine the impact of Africa's wave of democratization on income per capita at the national level. I use two measures of democracy, a dichotomous index and a continuous index. For the dichotomous index, a country is classified as a democracy if it satisfies two conditions. First, its Polity2 score from Polity5 is strictly greater than zero. Second, Freedom House classifies it as either free or partly free.[3] This measure captures the average within-country effect of being in a democracy relative to periods of nondemocracy – regardless of whether the transition is temporary or permanent. The continuous measure uses the liberal democracy (libdem) index from V-Dem, which ranges from 0 to 1, with higher values denoting improvements in democracy. The libdem index goes beyond electoral democracy and captures broader attributes of democracy such as the rule of law, constraints on the executive, protection of individual and minority rights, and freedoms of the press and civil society organizations. These two measures allow me to identify the impact of various aspects of democracy on income.

Both measures of democracy show a significant positive impact on income. On average, being in a democratic regime, as opposed to a nondemocratic one, is associated with a 1.2 % higher income per person. This translates to an increase of $ 24.17 per person during the

comparatively longer democratic traditions.

[2]The exceptions were D.R. Congo, Eswatini, Nigeria, and Somalia. Nigeria did hold presidential elections in June 1993, but the then military junta annulled the results.

[3]This classification is borrowed from (Acemoglu et al., 2019).

sample period (1990–2018). On the other hand, a 10 % increase in the libdem index leads to a 1.3 % increase in GDP per capita. In other words, a full-range increase in the index from 0 to 1 is associated with a 13 % increase in income per person, equivalent to $ 270. Although these estimates are not necessarily causal due to time-varying omitted variables, they remain robust to standard controls and region-specific time trends.

I investigate the mechanisms through which Africa's democratization could have influenced national income. I show that Africa's democratization has had significant impacts on critical determinants of economic growth, including physical capital accumulation, human capital, economic liberalization, trade expansion, and foreign capital inflows. I also address potential confounding factors like the structural adjustment programs (SAPs) that were implemented in the region during the same period. These market-oriented reforms, aimed at liberalizing African economies, could independently influence income levels, making it challenging to isolate the impact of democratization. However, my analysis suggests that the positive relationship between democratization and income remains robust even after accounting for the potential effects of SAPs.

In the remainder of the study, I classify countries into consolidated democracies and non-democracies using both the dichotomous and continuous measures of democracy described earlier. I then identify ethnic groups that live across borders dividing these contrasting regimes. Because ethnic groups on both sides of the border share similar cultural, historical, and social traits, any long-term differences in development between democratic and nondemocratic partitions can be attributed to differences in political regimes. If democratization has a meaningful impact on economic and development outcomes, as suggested by my national-level analysis, we should observe better development outcomes on the democratic side of these borders.

This identification strategy rests on two key assumptions. First, the two partitions of a given ethnic group should differ only in the political regime they are subject to, not in other factors that might affect development. Second, the drawing of colonial borders that split ethnic groups should not have systematically influenced state formation in a way that biases development outcomes today. My analysis confirms that both of these assumptions hold.

For the border analysis, I use square grid cells of size 10 km x 10 km to capture subnational development through nighttime lights, a well-established proxy for local development (economic activity). In the first instance, I assign each grid cell its respective country's democracy score and regime classification over time, and then run a panel fixed effects estimation to examine the impact of democratization on subnational development. The results show a robust positive relationship between democratization and local development. A one-point increase in the liberal democracy index (libdem) raises the probability of a grid cell

having light at night by 14 percentage points (pp). Similarly, moving from a nondemocratic regime to a democratic one increases this probability by 5 pp.

Next, I use a within-ethnicity Regression Discontinuity (RD) design to estimate development differences across democratic and nondemocratic partitions over time. The within-ethnicity specification allows me to neutralize the confounding effects of ethnic-related factors so that I estimate the difference in development outcomes between two ethnic partitions (or members) as a function of regime type.[4] Here, the border serves as the "threshold" where the probability of living under a democratic regime changes abruptly (Keele and Titiunik, 2015). For my preferred estimates, I fit separate linear polynomials on each side of the border within a 50 km bandwidth to allow for different development trends in democratic and nondemocratic areas.

The results from the RD analysis can be summarized as follows. In the early years of democratization, there were small or negligible differences in development levels between democratic and nondemocratic ethnic partitions. For instance, as of 1993, a grid cell in a democratic partition was no more likely to have light at night than its counterpart in a nondemocratic partition. However, beyond this point, nighttime lights in democratic partitions began to increase more rapidly, leading to a significant development gap over time. Two decades later, a grid cell in a democratic partition was, on average, 7 pp more likely to have light at night compared to a grid cell in a nondemocratic partition. Given the subnational nature of the sample, this represents a substantial divergence, equivalent to a 37 % increase above the average grid cell's probability of having light at night. These results remain robust across various sensitivity checks, including changes to the dependent variable, the addition of local controls, adjustments for historical development and population distribution, and the use of a two-dimensional RD design. They are also robust to using optimal bandwidth estimators as well as assigning different development trends to ethnic partitions. Using different democracy classifications does not also alter the main results.

In addition to the aggregate results, I examine micro-level disparities across democratic and nondemocratic partitions using a newly compiled individual-level data on individuals belonging to partitioned ethnicities. I find that members of split groups residing on the democratic sides of borders exhibit significantly better socioeconomic conditions compared to those on the nondemocratic side. For instance, residing on the democratic side reduces economic insecurity – an index measuring how frequently people face shortages of basic necessities – by about 24 pp points on a 0—100 scale. It also improves self-reported wellbeing by approximately 7.5 pp. These disparities appear to be driven by better access to education and formal employment opportunities on the democratic side. Residents in democratic

[4]This RD approach is conceptually similar to comparing how the same individual would fare under both democratic and nondemocratic systems, assuming that the individual is observed in both regimes at the same time.

partitions are more likely to be wage-employed and have higher educational attainment. Similar patterns emerge when comparing access to public goods. The democratic side has better infrastructure, particularly paved roads, electricity, and sewage systems. I also find no evidence that these differences are driven by selective migration. That is, the the observed disparities are largely attributable to differences in political regimes, rather than individuals moving to more developed areas.

To provide more granular evidence, I conduct a case study of the Ghana-Togo border, one of the most striking democracy-nondemocracy divides in Africa. Ghana has steadily strengthened its democratic institutions since transitioning to democracy in 1992, while Togo has remained under one-family autocratic rule since the 1960s. These starkly contrasting regime types provide a compelling natural experiment to further assess the development impacts of democratization across the Ghana-Togo, which divides at least 15 culturally and historically similar ethnic groups.

I compare human capital outcomes, mainly years of schooling and access to formal education, across the Ghana-Togo border by examining birth cohorts before and after Ghana's democratic transition (1992). If democratization improves human development, we should see better educational outcomes for post-democratization cohorts on the Ghana side, compared to their counterparts on the Togo side. The results support this hypothesis. After democratization, individuals born on the Ghana side gained about one additional year of schooling compared to those on the Togo side. They were also 7 pp more likely to have some form of formal education. These differences are not observed for the pre-democratization cohorts, suggesting that political regimes, rather than pre-existing factors, drive these disparities.

To further validate my findings from the border analysis, I conduct a falsification analysis using an old colonial border that no longer divides ethnic groups and/or political regimes. This pseudo border provides a useful test in that since there are no regime differences on either side of the border today, we should not (per the study's main hypothesis) observe significant disparities in development outcomes across this border. The results indeed show no systematic differences in development across the pseudo border. This reinforces the conclusion that the observed development gaps across democratic and nondemocratic partitions are driven by post-independence regime differences, rather than historical or geographic factors.

This study makes two broad contributions to the literature. First, it provides a comprehensive investigation of the economic and development impacts of Africa's wave of democratization. The findings show that democratization is associated with higher income levels and better development outcomes across the continent. While this adds to earlier research on the link between democracy and growth in Africa (Feng, 1996; Fosu, 2008; Lewis, 2008;

Tiruneh, 2006; Van de Walle, 1999), it goes further by improving both the measurement of democracy and the empirical methods used. Importantly, this study is the first to examine the subnational development effects of democratization in Africa.

Second, the study contributes to the broader literature on the relationship between democratization and economic performance. One of the main challenges in this field has been endogeneity – the difficulty in determining whether democracy leads to better economic outcomes or whether richer countries are more likely to democratize. By focusing on Africa, this study mitigates many of these challenges. Despite their within-country differences, African states share similar historical and institutional legacies, which helps to reduce confounding factors (Berg-Schlosser, 1984; Ravenhill, 1980). Moreover, using Africa's colonial borders as a natural experiment allows me to further isolate the causal impact of democratization. To my knowledge, this is the first time such a *natural experiment* approach has been used in the related literature. I am also not aware of any previous study documenting the impact of democratization on *subnational* development.

The remainder of the study is organized as follows. The next section discusses the related literature, providing context for the study. In Section III., I examine the impact of democratization on income at the national level using a dynamic panel fixed-effects model. Section IV. focuses on the border analysis, where I identify ethnic groups split across borders dividing consolidated democracies and nondemocracies. The data and methodology used in the study are also described in this section. The empirical results from the border analysis are presented in Section V., followed by a case study of the Ghana-Togo border. I conclude the study in Section VI.. The falsification analysis is conducted in Appendix B.

II. Related Literature

This study examines the relationship between democracy and economic performance or development in Africa. Thus, this study is related to the literature investigating the association between democracy and economic growth in Africa. Although existing research finds a positive association between democracy and income in the region, many studies suffer from significant empirical limitations. Some, such as Lewis (2008) and Van de Walle (1999), offer primarily descriptive analyses, while others rely on aggregate data that overlooks critical growth variations (Feng, 1996; Fosu, 2008; Tiruneh, 2006). Studies using annual panel data, such as Bates et al. (2012), Carbone et al. (2016), and Knutsen (2013), often fail to account for both country- and time-specific effects, thereby limiting their explanatory power.

A few exceptions stand out. For instance, Nkurunziza and Bates (2003) employ system GMM estimations to explore the impact of political variables – such as regime type, stability, and violence – on economic growth in Africa. Their findings indicate a significant and positive effect of democracy on growth. However, their analysis is built upon Hoeffler's

(2002) critique of the flawed "African dummy" in growth regressions. Moreover, their data covers the period from 1960 to 1990, which precedes Africa's wave of democratization, and their data is also quinquennial.

Another exception is De Kadt and Wittels (2019) who employ a synthetic control method and investigate the economic impacts of Africa's wave of democratization. They report mixed results, with both positive and negative effects depending on the country case. Similarly, Masaki and van de Walle (2015) examine the impacts of "democracy level" and "democracy duration," showing that the economic benefits of democracy are more pronounced in countries with longer democratic histories. Despite their contributions, these studies, unlike the current study, fail to account for the potential bias arising from economic downturns prior to democratization. Also, my model provides a direct comparison of the economic performance of democratic and nondemocratic regimes in Africa. This modeling is especially relevant given the frequent fluctuations in regime type across the continent.

The study is also related to works specifically examining the impact of Africa's 1990s democratization wave. Bates (2006) use a combination of principal-agent theory and empirical analysis to examine whether the democratic reforms of the 1990s influenced policy outcomes. He concludes that, while democratization curtailed the opportunistic use of political power, it also heightened the risk of political instability and failed to produce sound macroeconomic policies. Kudamatsu (2012) uses household-level data to show that democratization substantially reduced infant mortality rates in Africa. Similarly, Fetzer et al. (2016) investigate the impact of this wave of democratization on urbanization patterns, finding that democratic reforms led to more uniform growth across cities, with non-capital cities experiencing catch-up growth. My study adds to this line of work by examining the economic and long-term development impacts of Africa's wave of democratization.

My study also relates to the literature on democracy's impact at the micro level. Using individual-level data, I show that democratization is associated with improvements in human development, such as higher educational attainment and increased access to formal education. This finding is corroborated by two related works. The first is Harding and Stasavage (2014) who demonstrate that educational attainment is higher in African democracies because these regimes are more likely to abolish school fees. The second study is due (Stasavage, 2005) who show that democratization spurred increased public spending on education in Africa. In addition to education, my study documents positive effects of democracy on subjective well-being, economic security, and access to public goods. According to Dorn et al. (2007), higher self-reported well-being in democratic societies stems from citizens' greater participation in political processes, a perceived sense of fairness, and political outcomes that align more closely with public preferences. The provision of public goods is also higher in democracies because these regimes need to garner broader popular

support (Deacon, 2009).

Another related strand of literature is the body of work examining the political economy of African borders. The continent's current state borders were hastily drawn during the late 19th century by European colonizers. With minimal regard to ethnic geography, the demarcation process resulted in splitting ethnic groups across multiple countries, a historical accident that has persisted till date (Asiwaju, 1985). Numerous studies have documented the long-term consequences of this ethnic partitioning. For instance, Michalopoulos and Papaioannou (2016) show that ethnic partitioning has led to higher conflict prevalence and persistent economic disparities in partitioned regions. It has also increased political instability and secessionist movements (Englebert et al., 2002). More closely related studies exploit the designs of the borders to study various outcomes. For instance, Michalopoulos and Papaioannou (2014) leverage the border designs to investigate the effects of national institutions on subnational development, while (Dimico, 2017) leverage them to study the effect of ethnic group size on economic development. My study is the first to exploit these border designs to study the effect of democratization on development outcomes.

My work is also closely related to the literature on state penetration in Africa. Some scholars argue that African states have limited reach as they often struggle to extend their authority beyond the capital and/or major cities (for example, see Forrest, 1988; Herbst, 2000). This idea implies that development in rural areas and border regions is less likely to be influenced by national institutions or political regime type. Indeed, Michalopoulos and Papaioannou (2014) find that, with the exception of areas near border capitals, national institutions have no impact on development in border areas. However, my findings suggest that state penetration is stronger in Africa's democracies. Democratic partitions exhibit significantly higher levels of development, even in regions far from capital cities.

Lastly, my study relates to the ongoing discourse on the current state of democracy in Africa. The region has witnessed a resurgence of military coups and democratic backsliding in recent years. Powell and Thyne's (2011) military coup data shows that there were 14 coup attempts in Africa between 2020 and 2023, nine of which were successful. Despite this trend, public support for democracy in Africa remains strong (Gyimah-Boadi, 2015; Mattes, 2019). Afrobarometer's round 8 survey (2020/2021) shows that about seven out of ten Africans prefer democracy over other forms of government. One interesting pattern of the recent wave of coups is that they predominately occur in Africa's failed democracies. My findings suggest that sustained, improved development in consolidated democracies may have played a role in reducing military interventions.

III. Democratization and Economic Performance in Africa

In this section I examine the impact of Africa's wave of democratization on economic performance (GDP per capita). My sample covers all contemporary sub-Saharan African (SSA) countries from 1990 to 2018.[5] The period 1990–2018 is chosen to capture the effects of post-1990 democratization trends. Moreover, the Polity5 dataset, a key source of democratic indicators used in the study, currently ends in 2018. All economic data are sourced from the World Development Indicators (WDI).

III.I Empirical Framework

I estimate the impact of democratization on GDP per capita (in constant 2015 dollars) using the following dynamic panel fixed effects model:

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

where y_{ct} is the natural logarithm of GDP per capita for country c in year t. The first term on the right represents the lags of log GDP per capita. The inclusion of lagged dependent variables captures GDP persistence and income convergence dynamics. This approach also helps mitigate potential bias arising from the dip in GDP that often precedes democratization events (Acemoglu et al., 2019). The dip in income prior to Africa's democratization can be observed in figure 2. GDP per capita declined just before the 1990s democratization wave and subsequently began to recover in the mid-1990s. Given that the sample begins in 1990, I include five lags ($q = 5$) of the dependent variable to account for this initial dip.

The term $Democ_{ct}$ represents a country's democratic status. Related studies choose either a categorical or a continuous measure of democracy. While categorizing countries into democracy or nondemocracy reduces the possibility of measuring outcomes as democracy, categorical indexes are heavily weighed by procedural aspects of a regime such as how the chief executive office is filled. While continuous measures correct this problem they are broad in scope and clouded by outcomes, making their use in empirical analysis unappealing. I use both measures of democratization to ensure robustness in my findings.

- Continuous Measure:

The continuous measure I use is the Liberal Democracy (libdem) Index from V-Dem. Libdem is a 0–1 continuous index (from low to high) encompassing various dimensions of

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

democracy. It is calculated as:

$$v2x\_libdem = .25 * v2x\_polyarchy^{1.585} + .25 * v2x\_liberal + .5 * v2x\_polyarchy^{1.585} * v2x\_liberal$$

where *polyarchy* represents electoral democracy and *liberal* emphasizes the liberal dimension of democracy. While electoral democracy measures electoral competition, fair elections, free civil and political organizations and independent media, the liberal aspect assesses the limits put on the government and the extent to which the rights of individuals and minority groups are protected against the tyranny of the state and that of majority groups. The liberal dimension also incorporates the rule of law and individual liberty, and the judicial and legislative constraints on the executive (Coppedge et al., 2016). The correlation between these two key components is high (0.87), hence I do not estimate their individual effects.

Figure 3 shows the average libdem score across SSA countries. The average libdem is relatively low (.27), with significant variation. Cabo Verde scores the highest (.68), while Eritrea has the lowest average (0.17). Only nine countries – Cape Verde, Mauritius, Botswana, South Africa, Namibia, Ghana, Sao Tome and Principe, Benin, and Senegal – achieved average scores above 0.50 during the sample period. Despite the low average, the libdem index turns out to have a strong positive association with income as shown in figure 4. Countries with a higher libdem score tend to have higher GDP per capita. This observation would be useful in later analysis where I categorize countries into consolidated democracies and nondemocracies.

- Categorical Measure:

For the categorical (dichotomous) measure I follow (Acemoglu et al., 2019) who identify a country as a *democracy* in a given year if it satisfies two conditions. First, its Polity2 score should exceed *zero* and, second, it is rated as either *free* or *partly free* by Freedom House. The Polity2 index characterizes regimes on a scale from -10 (full autocracy) to +10 (full democracy). The zero score generally serves as the threshold in characterizing a regime as democratic or otherwise.

Freedom House, on the other hand, classifies countries as either *not free*, *partly free* or *free*. In my sample, the average SSA country is labeled "not free" 11 times between 1990 and 2018. While 11 of them would be counted as "free" or "partly free," seven of them – Sudan, Somalia, Equatorial Guinea, Rwanda, Chad, Democratic Republic of the Congo, and Cameroon – are consistently classified as "not free" throughout the period.

Figure 5 illustrates the time-varying democratic statuses of SSA countries from 1990 to 2018. The figure depicts large disparities among countries. Thirteen countries are never classified as democracies during this period, while four remain consistently democratic. The remaining 31 countries switch between democracy and nondemocracy.

Using this categorical measure, $Democ_{ct}$ takes a value one if country c is a democracy in year t and zero otherwise. This categorization is especially relevant in the African context, where many countries frequently transition between democracy and nondemocracy. In a fixed effects framework, the estimated coefficient captures the within-country effect of being in a democracy compared to being in a nondemocracy. As such, identification relies on the 31 countries that experienced changes in regime status during the sample period. Thus, countries with no variation in democracy status do not contribute to the estimate.

γ_t represents year fixed effects, which account for global and year-specific shocks – such as commodity price shocks, global recessions, or geopolitical events – that could influence income across all countries in a given year. δ_i is country fixed effects, capturing time-invariant country-specific factors like geography, history, culture, language, and long-term institutional characteristics. These fixed effects ensure that my estimates reflect the impact of regime changes rather than underlying country- or year-specific characteristics. To control for regional dynamics, I also estimate models that include region x year fixed effects. These account for trends and shocks that may disproportionately affect specific African regions, such as droughts or political instability in some regions.

One concern with dynamic panel models like equation 1 is that including lagged dependent variables introduces an autoregressive component that can cause inconsistent estimates of α, particularly when T dimension is small. This bias arises because the lagged dependent variable is correlated with the error term through the fixed effects. However, this bias diminishes as T increases since the magnitude of the bias is proportional to $1/T$ (Kiviet, 1995; Nickell, 1981). Monte Carlo simulations demonstrates that when $T = 30$, fixed effects estimators perform as well as or better than alternatives like GMM estimators, which are often used to correct for dynamic panel bias (Judson and Owen, 1999). In my sample, $T = 29$, indicating that the bias from including lagged dependent variables should be minimal. Therefore, the fixed effects approach is well-suited to my study.

III.II Estimates

Table 1 presents the estimated impacts of democratization on income per capita. Columns (1) to (3) use the continuous measure of democratization (the liberal democracy index), while columns (4) to (6) employ the dichotomous indicator of democracy. The specifications in columns (1) and (4) include only the lags of the dependent variable, while columns (2) and (5) introduce additional controls for trade openness (imports plus exports), government consumption, household consumption, and gross fixed capital formation. All these controls are entered as natural logs of their percentages of GDP. Given the high number of missing observations associated with these controls, my preferred estimates are those in columns (1) and (4).

The results indicate a robust positive impact of democratization on GDP per capita. The estimate in column (1) suggests that a 10 % increase in the liberal democracy index leads to a 1.3 % rise in income per person. Interpreted differently, a full-range increase in the libdem index – from 0 to 1 – corresponds to a 13 % increase in income. Similarly, the dichotomous measure shows a comparable effect: the estimate in column (4) indicates that being in a democratic regime, relative to a nondemocratic one, is associated with approximately a 1.2 % increase in income per capita.

The inclusion of additional controls in columns (2) and (5) does not alter the main results. However, the coefficient for the dichotomous democracy indicator increases noticeably, suggesting that the economic benefits of being in a democracy may be stronger when controlling for changes in key economic variables. In columns (3) and (6), I further account for region-specific shocks and time trends by introducing region x year interactions.[6] These additional controls have little effect on the main findings.

How large are these impacts? Consider a country with the average GDP per capita in the sample, which is approximately $ 2,014.27. Shifting from a nondemocracy to a democracy increases this figure by 1.2 %, equivalent to about $ 24 additional income. Similarly, a full-range increase in the liberal democracy index corresponds to an increase of around $ 270 per person. These figures provide a rough approximation of the potential gains from democratization, though actual impacts will vary depending on a country's initial level of income.

III.III Discussion

The preceding results suggest that Africa's wave of democratization has a positive and significant impact on income. But through which channels did democratization drive these economic gains? Furthermore, Africa's democratization wave was preceded by – and in some cases coincided with – the era of Structural Adjustment Programs (SAPs), which mandated a retreat of government intervention in the economy. This raises a concern that the observed income gains may partly reflect the effects of these reforms. In this section, I explore these mechanisms and address this potential confounding factor.

Advocates of the democracy-growth relationship argue that democracy disciplines political leaders by introducing accountability mechanisms such as competitive elections which help reduce rent seeking and incentivize sound policymaking. In addition, in democracies "good performance" is electorally rewarded, encouraging governments to expand and efficiently deliver public goods and services (Adam et al., 2011). Investments in public goods in turn

[6] The regions are Central, Eastern, Southern and Western Africa. I use the categorizations from the African Union (AU). The only exception is Mauritania which I add as part of Western Africa although the AU classifies it as North Africa.

increase the stock of both physical and human capital, driving economic growth.

It has also been shown that democratization facilitates economic liberalization (see Rode and Gwartney, 2012) which is itself a key driver of growth (Aixalá and Fabro, 2009; Billmeier and Nannicini, 2013; Doucouliagos and Ulubasoglu, 2006). Additionally, democracies tend to experience lower levels of political instability, which reduces the risk of sudden, unconstitutional government changes that deter foreign investment. This is particularly relevant in the African context, where military coups and violent government overthrows remain more frequent in nondemocratic regimes.

I examine some of these mechanisms empirically. Specifically, I test the relationship between my measures of democratization and key income drivers including openness, physical capital, human capital, foreign capital inflows, and economic liberalization. Physical capital is proxied by gross fixed capital formation, and foreign capital inflows are measured by net foreign direct investments (net FDI). Primary school enrolment is used as proxy for human capital.

Economic liberalization is measured using the Economic Freedom of the World (EFW) index from the Fraser Institute. The EFW index assesses how closely a country's policies and institutions align with free-market principles. It has a summary index which is constructed based off 45 data points. It also includes five broad categories including the size of government, legal system and property rights, sound money, freedom of international trade, and regulation (Gwartney et al., 2023). Each of these five categories is measured on a 0–10 scale with higher values denoting increasing economic freedom. For my analysis, I use the average score across these five categories. The EFW data is available annually from 2000 onward, with pre-2000 data provided at five-year intervals.[7] Consequently, my analysis using the EFW index covers the period from 2000 to 2018.

The estimated effects of democratization on these income determinants are reported in table 2. Openness, physical capital, and capital inflows are expressed as natural logs of their percentages of GDP, while human capital is the natural log of the ratio of total school enrolment to the population of the corresponding age group.

III.IV Discussion

The preceding results suggest that Africa's wave of democratization has a positive and significant impact on income. But through which channels did democratization drive these economic gains? Furthermore, Africa's democratization wave was preceded by – and in some cases coincided with – the era of Structural Adjustment Programs (SAPs), which mandated a retreat of government intervention in the economy. This raises a concern that

[7]No data is available for Equatorial Guinea, Eritrea, and São Tomé and Príncipe.

the observed income gains may partly reflect the effects of these reforms. In this section, I explore these mechanisms and address this potential confounding factor.

Advocates of the democracy-growth relationship argue that democracy disciplines political leaders by introducing accountability mechanisms such as competitive elections which help reduce rent seeking and incentivize sound policymaking. In addition, in democracies "good performance" is electorally rewarded, encouraging governments to expand and efficiently deliver public goods and services (Adam et al., 2011). Investments in public goods in turn increase the stock of both physical and human capital, driving economic growth.

It has also been shown that democratization facilitates economic liberalization (see Rode and Gwartney, 2012) which is itself a key driver of growth (Aixalá and Fabro, 2009; Billmeier and Nannicini, 2013; Doucouliagos and Ulubasoglu, 2006). Additionally, democracies tend to experience lower levels of political instability, which reduces the risk of sudden, unconstitutional government changes that deter foreign investment. This is particularly relevant in the African context, where military coups and violent government overthrows remain more frequent in nondemocratic regimes.

I examine some of these mechanisms empirically. Specifically, I test the relationship between my measures of democratization and key income drivers including openness, physical capital, human capital, foreign capital inflows, and economic liberalization. Physical capital is proxied by gross fixed capital formation, and foreign capital inflows are measured by net foreign direct investments (net FDI). Primary school enrolment is used as proxy for human capital.

Economic liberalization is measured using the Economic Freedom of the World (EFW) index from the Fraser Institute. The EFW index assesses how closely a country's policies and institutions align with free-market principles. It has a summary index which is constructed based off 45 data points. It also includes five broad categories including the size of government, legal system and property rights, sound money, freedom of international trade, and regulation (Gwartney et al., 2023). Each of these five categories is measured on a 0–10 scale with higher values denoting increasing economic freedom. For my analysis, I use the average score across these five categories. The EFW data is available annually from 2000 onward, with pre-2000 data provided at five-year intervals.[8] Consequently, my analysis using the EFW index covers the period from 2000 to 2018.

The estimated effects of democratization on these income determinants are reported in table 2. Openness, physical capital, and capital inflows are expressed as natural logs of their percentages of GDP, while human capital is the natural log of the ratio of total school enrolment to the population of the corresponding age group. I include log GDP per capita

[8]No data is available for Equatorial Guinea, Eritrea, and São Tomé and Príncipe.

as a control since differences in income levels may independently influence openness, capital accumulation, foreign investment, human capital formation, and economic liberalization.

The results indicate that democratization positively affects most income drivers. Notably, the liberal democracy index is associated with significant increases in openness, physical capital, and economic liberalization. Democratic transition also has positive effects on these income determinants except capital inflows and economic liberalization. The finding that liberal democracy promotes economic liberalization aligns with expectations, given that aspects of liberal democracy – such as the rule of law and judicial independence – are captured within the EFW index.

Turning to the second concern about whether the observed effects of democratization on income are confounded by the SAPs. The SAPs of the 1980s primarily aimed to promote economic liberalization in Africa (Herbst, 1990; Rodrik, 1990). If SAPs were the primary drivers of growth, then controlling for economic liberalization should reduce or eliminate the democratization effect. To test this, I incorporate the EFW index into my main democracy-growth specification. The EFW index, to my knowledge, is the most comprehensive measure of economic liberalization available. Since the EFW index has shorter time coverage than other variables, I re-estimate the model using an AR(1) specification.

The results, reported in Panel B of table 1, show that economic liberalization significantly increases GDP per capita. A one-point increase in the EFW index corresponds to a 1.8 % to 2 % increase in GDP per capita. Importantly, after controlling for economic liberalization, democratization continues to have a positive and statistically significant impact on income. These findings suggest that while economic liberalization has contributed to Africa's economic growth, the observed democratization effect is not fully explained by SAP-driven reforms. Furthermore, some of the SAP-related effects are likely captured by the openness variable, which I have consistently included as a control. Nevertheless, it is important to note that the EFW index may not capture all components of SAPs, such as fiscal austerity and debt restructuring, which could also influence growth. Additionally, some aspects of the EFW index, such as rule of law and property rights, are likely influenced by democratization itself, making it challenging to fully disentangle the effects of SAPs from democratization.

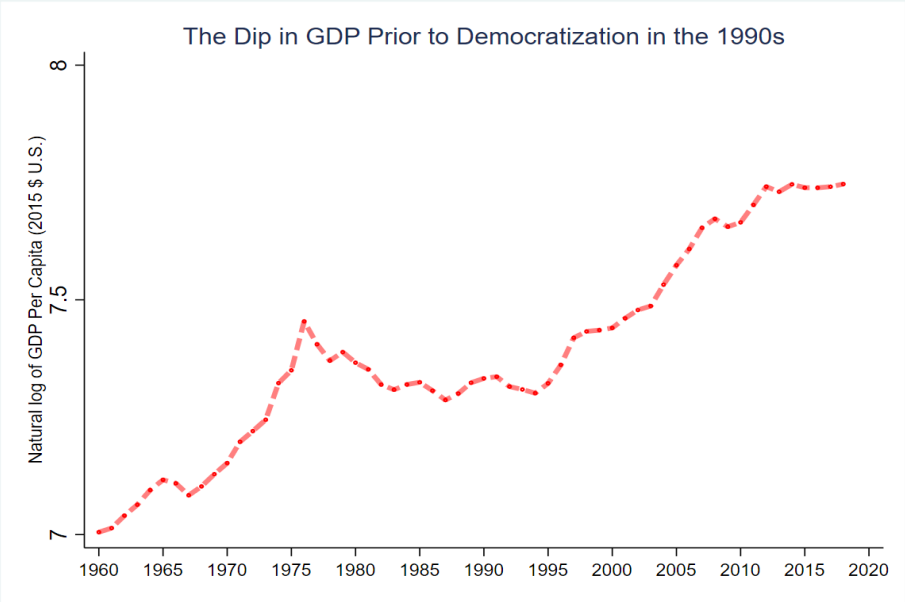


Figure 2: The figure shows the dip in GDP per capita prior to Africa's democratization in the early 1990s. Natural log of GDP per capita is in 2015 dollars. Data is from the World Development Indicators.

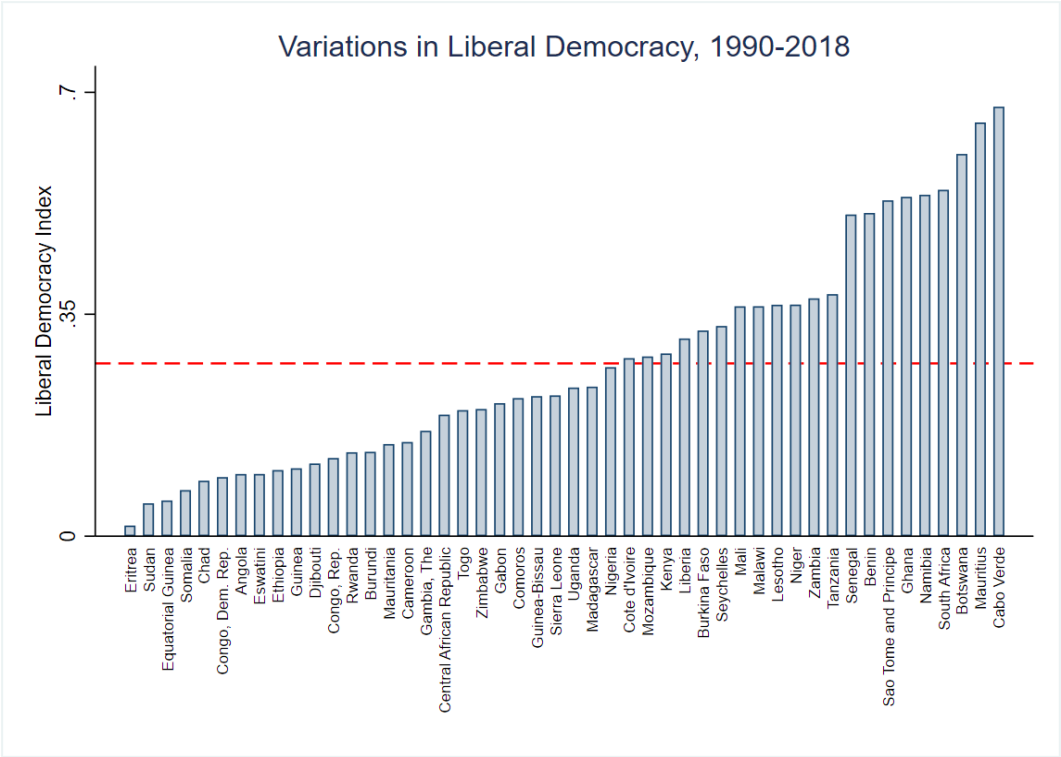


Figure 3: The figure shows countries' liberal democracy scores (libdem index) averaged between 1990 and 2018.

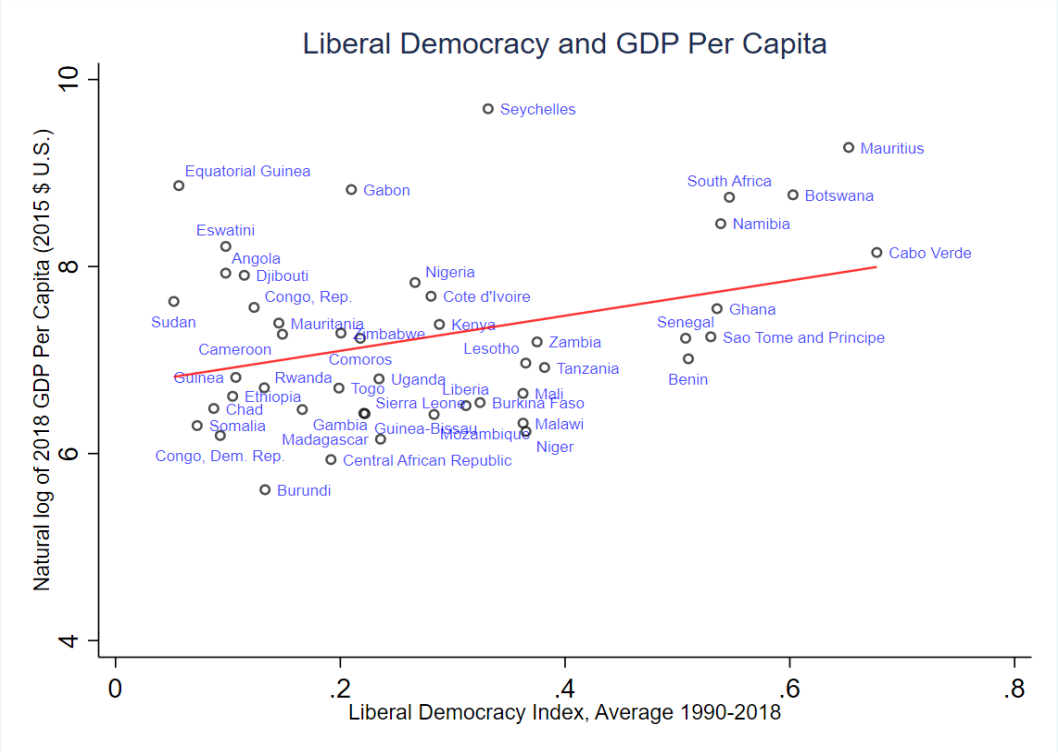


Figure 4: The figure shows the correlation between the liberal democracy index (average of 1990–2018) and GDP per capita (natural log of 2018 GDP per capita in 2015 dollars).

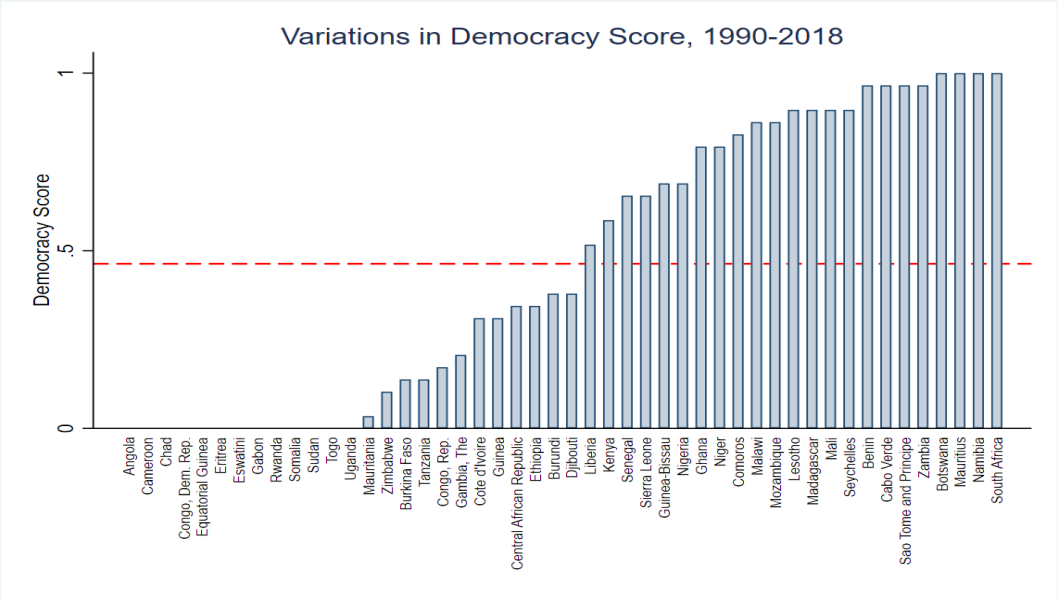


Figure 5: The figure shows countries' democracy scores averaged between 1990 and 2018.

Table 1: Democracy and Income

	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A. Impact of Democratization on Income					
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 previous analysis demonstrates a positive association between democratization and per capita income. However, panel fixed effects models do not fully address the concern that the relationship may be driven by unobserved time-varying factors. Omitting important variables can lead to biased estimates. Moreover, panel fixed effects models cannot adequately account for the potential reverse causality between democracy and development, where higher income levels may also increase the likelihood of democratization.

To address these concerns, I leverage a natural experiment created by the "arbitrary" partitioning of African ethnic groups across 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

African borders are infamously noted for splitting ethnically homogenous groups into different countries. Groups sharing a common history, language, customs, and institutions often live on both sides of African borders. These partitioned groups make up a significant share of national populations. On average, they account for at least 40 % of their respective country's population (Englebert et al., 2002; Englebert, 2000). In some extreme cases such as Senegal, Burundi, Rwanda, and Zimbabwe partitioned groups comprise more than 90 % of the population (Alesina et al., 2011).

The contemporary borders of Africa were drawn by European colonizers during the Scramble for Africa in the late 19th century. European powers, eager to expand their spheres of influence, formalized territorial claims to prevent conflicts and wars among themselves. This process resulted in the arbitrary division of homogeneous ethnic groups into different colonial spaces which subsequently morphed into contemporary African states. Borders divided people because Europeans had limited knowledge about the continent at this time (except the coast regions). Spheres of control and/or mandated territories were also allotted with no anticipation of them becoming sovereign states in the foreseeable future.

There is, however, an ongoing debate about whether African borders were drawn entirely arbitrarily. Paine et al. (2024) argue that not all African borders were randomly drawn as some of them followed pre-existing political frontiers or natural features such as rivers and mountains. In contrast, Müller-Crepon et al. (2023) demonstrate that ethnic geography played a minimal role in shaping state borders in Africa, unlike in other regions.

My identification strategy does not necessarily or solely depend on whether these borders

were drawn arbitrarily. The identification strategy relies on the assumption that ethnic geography did not systematically shape African border formation. Even if ethnic boundaries influenced some border design, this would only pose a threat to causality if the act of partitioning itself directly affected contemporary development outcomes. However, existing research shows that split and non-split ethnic groups are not systematically different in ways that would independently explain current development patterns (Michalopoulos and Papaioannou, 2016). Therefore, my main argument is that ethnic groups partitioned by borders would have experienced similar long-term development trajectories if not for differences in political regimes.

A second critical assumption is that the main factor that systematically changes at democracy-nondemocracy borders is regime type. This assumption is essential for identifying the causal effect of democratization on development. If other factors systematically changed at the border, it would require additional assumptions to isolate the effect of regime type on development.[9] However, to the best of my knowledge, no other factors, including other administrative or political boundaries, change systematically across African borders.

IV.II Identifying Democratic-Nondemocratic Ethnic Partitions

I identify partitioned groups by overlaying contemporary African state borders on Murdock (1959)'s ethnic map which depicts the spatial distribution of more than 840 ethnic homelands across the continent. This exercise is visually depicted in figure 6a. The red lines represent contemporary African state borders, while the blue lines denote ethnic boundaries.

To distinguish democratic from nondemocratic partitions, I categorize countries into consolidated democracies and nondemocracies (or failed democracies) based on two strict criteria. First, a country must demonstrate a sustained democratic tradition, meaning it has been consistently classified as a democracy (as defined in Section III.) since the 1990s. This criterion excludes countries with only temporary democratic episodes or those that made a recent permanent transition to democracy (post 2000).

Second, a country must have made significant progress on liberal democracy. Specifically, it should achieve an average annual Liberal Democracy Index score of at least 0.50 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. Moreover, African countries tend to underperform on the liberal dimension of democracy, making a score of 0.50 a meaningful milestone. For instance, 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 the 0.50 threshold on the

[9]For example, one would have to assume that regime type alone is responsible for development differences at the border, which could be problematic if other factors also vary across borders.

liberal democracy scale. In effect, my analysis focuses on comparing Africa's top-performing democracies to its nondemocracies or fragile democracies. I later relax this threshold to test the robustness of my findings.

Applying these criteria yields eight consolidated democracies: Benin, Botswana, Cabo Verde, Ghana, Mauritius, Namibia, Sao Tome and Principe, and South Africa. However, three of these countries – Cabo Verde, Mauritius, and Sao Tome and Principe – are excluded from the analysis because they are island nations with no shared land borders. This leaves five consolidated democracies that share borders with ten nondemocratic neighbors: Angola, Burkina Faso, Côte d'Ivoire, Eswatini, Mozambique, Niger, Nigeria, Togo, Zambia, and Zimbabwe.

The borders separating these democratic and nondemocratic regimes are depicted in figure 6b.[10] Along these borders, I identify 56 ethnic groups that are partitioned between democratic and nondemocratic states. To account for any potential errors stemming from digitizing the ethnic map as well as account for the possibility that minor partitions are unlikely to be inhabited, I consider only groups that have at least 5 % of their ethnic homeland located on either the democratic or nondemocratic side of the border.[11] This refinement leaves 45 major partitioned ethnic groups across democratic-nondemocratic borders.

These partitioned groups are displayed in appendix table A1. The table lists the countries they are split into, the percentage of their homeland in each country, and the proportion falling on the democratic side of the border. While most groups are split between two countries, some are divided across three or four countries. The share of an ethnic group's homeland on the democratic side varies significantly. It ranges from a low of 5.5 % for the Busansi – split between Ghana, Burkina Faso and Togo – to a high of 92.5 % for the Dagombas across the Ghana-Togo border.

Note that where groups are split between two countries, the democratic share corresponds to the portion of its homeland in the democratic country. However, for groups divided across three or more countries, the democratic share is the sum of all parts of the group located in democratic states. For example, the Mbukushu are split between Angola (73.7 %), Namibia (11.6 %) and Botswana (14.7 %). In this case, the democratic share of the Mbukushu is 26.3 %, representing their combined presence in Namibia and Botswana. The regression discontinuity (RD) design estimates will thus measure the difference in development levels between the democratic side of the Mbukushu (26.3 %) and the nondemocratic side (73.7 %).

Using these partitioned ethnic groups to identify the causal impact of democratization

[10] The consolidated democracies in southern Africa share contiguous border, allowing me to treat them as a single bloc separated from their nondemocratic neighbors by a continuous border.

[11] See a similar approach by (Michalopoulos and Papaioannou, 2016, 2014)

relies on the idea that each ethnic partition on one side of the border serves as a valid counterfactual for its counterpart on the other side. In other words, the democratic and nondemocratic partitions of a given ethnic group should be similar in all respects except for regime type. Therefore, all else being equal, any long-run persistent development divergence between the two sides can be attributed to differences in political regime.

To illustrate this logic, figure 7 shows the ethnic groups straddling the Ghana-Togo border, while figures 8a and 8b present the trends in liberal democracy and the duration of democratic governance in Ghana and Togo. Both countries followed similar political trajectories before 1992, apart from brief democratic episodes in Ghana during 1969–70 and 1979–80.[12] However, following its sustained democratic transition in the early 1990s, Ghana consistently outperformed Togo on the liberal democracy index. This divergence illustrates the varying regime types experienced by partitioned ethnic groups on either side of the border. It is this variation that allows me to estimate the causal effect of democratization on development outcomes.

IV.III Threats to Identification

The primary challenge to the identification strategy is the possibility of selective migration across democratic and nondemocratic partitions. If individuals systematically migrate across borders based on regime type, the observed differences in development outcomes may reflect migration patterns rather than the direct effect of democratization.

Addressing potential biases from selective migration is challenging, particularly when the analysis covers a wide range of borders and ethnic partitions. However, examining this challenge is crucial since my main goal is to ensure that the observed differences in development outcomes are truly driven by democratization rather than population movements. While migration patterns across African borders are difficult to observe directly, understanding the likely direction of migration flows provides insights into the potential bias in my estimates. For instance, individuals may be more inclined to migrate from nondemocratic to democratic areas in search of better economic opportunities or political freedoms, which would bias the estimates upward.

To assess whether migration poses a serious threat to identification, I examine (predetermined) individual-level characteristics across democratic and nondemocratic partitions using Afrobarometer survey data from rounds 5 to 8. I compare age, gender, and type of residence (rural or urban) for individuals from split ethnicities across borders. Although type of residence is not strictly predetermined, it provides useful insights into migration patterns. For instance, rural areas are typically out-migration zones, whereas urban areas

[12] The spike in Ghana's democratic score in 1969–70 corresponds to the National Assembly elections held on August 29, 1969, while the spike in 1979–80 reflects the presidential elections held on June 18, 1979.

are often migration destinations.

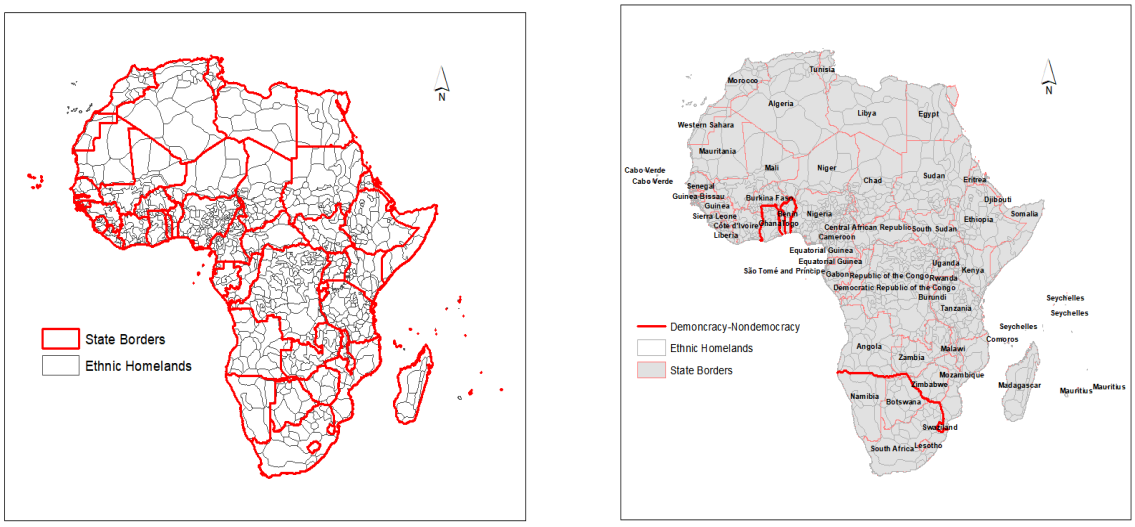
I test for discontinuities in these characteristics across borders by fitting separate slopes for each side of the border within 50 km and 100 km radii. The results, presented in appendix table A2, provide important insights into migration patterns. The findings from the narrow window (50 km radius) show no statistically significant differences across borders in terms of age and gender, suggesting no major evidence of selective migration. Within the 100 km radius, the gender remains insignificant, but the age variable shows a negative and marginally significant coefficient, indicating that the population on the democratic side is slightly younger.

However, the most notable finding is that, for both windows, democratic areas tend to be more rural than their nondemocratic counterparts. Although this rural-urban divide does not necessarily imply a net migration flow from nondemocratic to democratic areas, it suggests that the main estimates will be conservative. If rural areas, which tend to have lower development indicators, are more prevalent on the democratic side, this would mean that my estimates will likely understate the true impact of democratization on development.

It is also important to note that selective migration is primarily a concern for survey-based data. This threat is less severe when using aggregate data, such as nighttime lights, which are less sensitive to individual migration patterns. Migration would only bias nighttime light estimates if it caused disproportionate growth of border cities on one side of the border, resulting in artificially higher light density. However, most African border regions lack large urban centers that could drive such biases. Moreover, I exclude capital and commercial cities from the analysis to further mitigate this risk. I further binary-transform the light data to reduce the influence of extreme values from large urban centers.

As a last check of bias, I compute estimates using wider neighborhoods around the borders to examine whether my results hold when the analysis includes broader areas. This approach provides a way to gauge the direction and magnitude of the bias of my preferred estimated from the narrow window.

While migration is the most significant potential threat, other risks to the identification strategy could exist. One such risk is that democratic and nondemocratic partitions may have already diverged in development prior to the democratization wave of the 1990s. However, my results indicate that development levels across these borders were comparable during the early years of democratization. This suggests no pre-existing disparities existed or that any such disparities had diminished by the time democratization began.



(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.

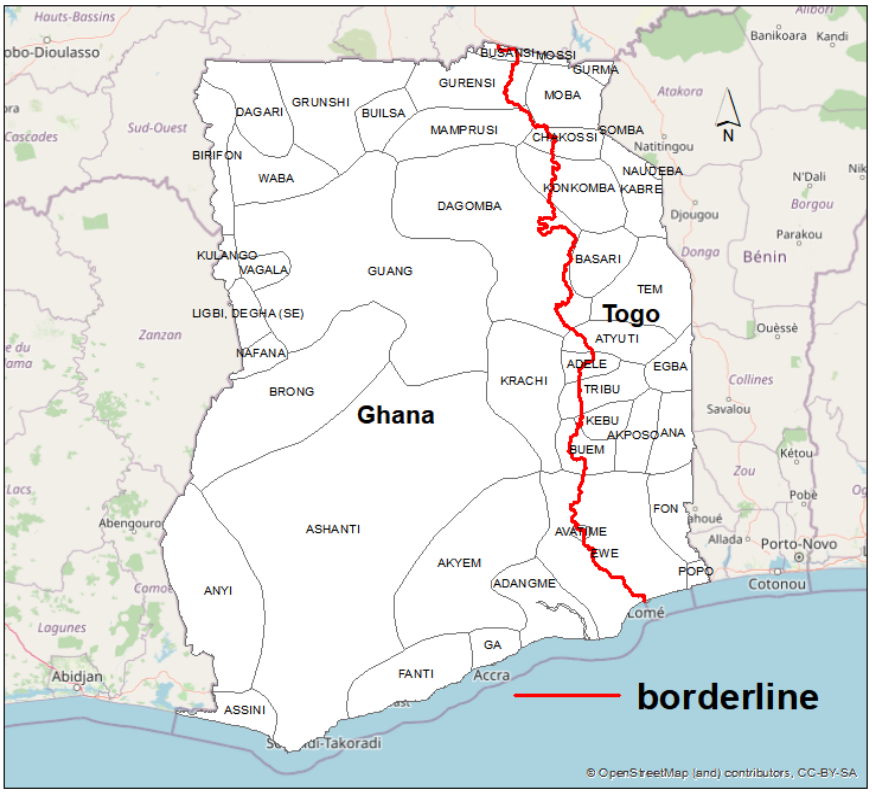
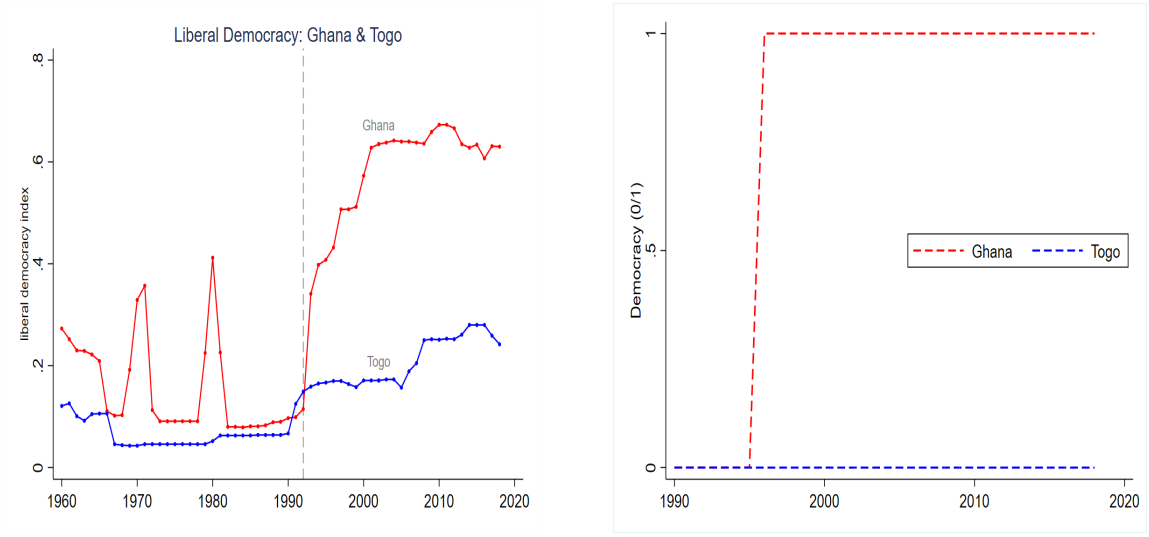


Figure 7: Sample Partitioned Ethnic Groups Across Ghana-Togo border.



(a) (b)

Figure 8: The left panel shows trends in liberal democracy (libdem index) while the right panel shows duration of democracy

IV.IV Estimation Framework I: Panel Fixed Effects Estimation

In the border areas I first estimate the impact of democratization on development using a panel fixed effects estimation at the grid cell level. I assign each grid cell the yearly liberal democracy score and dichotomous democratic classification (democracy or nondemocracy) of the country in which it is located. The regression equation is specified as follows:

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

The dependent variable y_{gt} represents the development outcome (nighttime light) for grid cell g in year t. The key explanatory variable, $Democ_{gt}$, captures the democratic status of grid cell g in year t, measured by the country's libdem index and dichotomous democracy classification. To control for time-invariant characteristics specific to each grid cell, I include grid cell fixed effects (ϕ_g), which account for factors such as geography, infrastructure, and ethnic composition that remain constant over time. Additionally, I control for year-specific shocks using year fixed effects (γ_t).

IV.V Estimation Framework II: Geographic Regression Discontinuity

The second estimation strategy I employ is a geographic regression discontinuity (RD) design. Let ethnic group e occupy a space with total area 1, where today ρ represents the proportion of its homeland (or share of its members) that falls within a consolidated democracy, and $1 - \rho$ falls within a nondemocracy. I estimate the development disparities

between ρ and $1-\rho$ using the following equation:

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

In this specification, y_{ic} denotes the outcome variable (such as nighttime light or individual-level socioeconomic indicators) for unit i (either a grid cell or respondent) in country c. ρ represents the share of ethnic group's homeland identified as a democracy. Since my unit of analysis is either at the grid cell or respondent level, this can alternatively be interpreted as a dummy equals one if grid cell (respondent) i is located (living) in a consolidated democracy and zero otherwise.

The function $f(DB_{ic})$ represents a polynomial of unit i's geodesic distance to the border. For my preferred specification, I use a local linear regression within a 50 km radius (100 km diameter), fitting separate slopes for democratic and nondemocratic sides. The advantage with local linear regression is that it addresses the drawbacks of bias, inflexibility, and sensitivity of estimates to boundary points associated with higher-order polynomial fits (Gelman and Imbens, 2019).

Conducting RD analysis within a narrow neighborhood around the border offers trade-offs between variance and bias. A smaller radius reduces bias by ensuring that units compared are geographically close and more similar. However, it comes at the cost of higher variance due to the reduced number of observations (Cattaneo et al., 2019; Fan and Gijbels, 1996). To ensure the robustness of my estimates, I report additional results using wider windows and higher-order polynomials (such as cubic fits). Additionally, I test my results using optimal bandwidth selection methods to ensure my findings are note entirely dependent on my choice of neighborhood.

η_e is ethnicity fixed effects, controlling for ethnic group-specific, time-invariant characteristics. These could include factors such as shared language, culture, or pre-colonial institutions that might influence development outcomes. By controlling for these within-ethnicity characteristics, I ensure that the comparison is driven by differences in political regimes rather than ethnic-specific factors. In other words, this within-ethnicity specification allows me to estimate the development difference between ρ and $1-\rho$, netting off the confounding effects of ethnic-related factors. It follows that for every partitioned group with a share ρ on one side of the border, there is a corresponding share $1-\rho$ on the other side. The estimates are thus derived from matching pairs of ethnic partitions.

The coefficient of interest, τ, captures the local average treatment effect (LATE) of democratization on development outcomes across the border. In the context of geographic RD design, this treatment effect may vary along different points of the border. Therefore, conceptually, τ represents the average LATE across all boundary points where regime change

occurs (Keele and Titiunik, 2015).

IV.VI Data

This section describes the two primary data sources used in the border analysis: nighttime light density as a proxy for subnational development and survey data capturing individual-level socioeconomic outcomes.

IV.VI.I Measuring Subnational Development

Accurate and reliable income statistics at fine subnational levels are largely unavailable for African countries. To address this limitation, I use nighttime light density as a proxy for subnational development or income levels at the border. The light data comes from the Defense Meteorological Satellite Program's Operational Line-Scan System (DMSP-OLS) and covers the period 1992–2013.

The DMSP-OLS satellites capture light images across the globe each night, covering longitudes -180 to 180 degrees and latitudes -65 to 75 degrees. The captured images are processed to remove cloud cover, ephemeral lights (such as lightning or wildfires), and other noise that may distort the data. The processed images are then divided into grid pixels, each measuring 1 sq. km. The pixels are assigned digital numbers (DNs) ranging from 0 to 63. A DN of 0 indicates no detectable light, while higher values reflect greater light density, which correlates with economic activity and development.

Nighttime light density has become a widely accepted proxy for economic development and income levels, especially in contexts where official income data is sparse or unreliable. It has several advantages over other proxies of income or development. Compared to other proxies of income such as national GDP, light data is more objectively collected and less susceptible to manipulation by governments or institutions (Martinez, 2022). Light data is also available at a high spatial resolution (approximately 1 sq. km), which allows me to track development at the border at a precise resolution. Further, unlike traditional income measures, which may be plagued by missing data or poor reporting practices, light data provides consistent coverage across time and space.

To conduct the border analysis, I construct square grid cells measuring 10 km x 10 km. For each grid cell, I extract the corresponding nighttime light density values for every year from 1992 to 2013. These grid cells form the primary unit of analysis in the panel fixed effects and regression discontinuity (RD) models discussed earlier. By using grid cells rather than administrative boundaries, I ensure that the analysis is spatially precise. using equal-sized grid cells also ensures that localized development patterns do not entirely stem from pre-existing historical or administrative boundaries.

IV.VI.II Individual-level Outcomes

I also use individual-level data from Afrobarometer survey rounds 5–8 to compare disparities in socioeconomic outcomes across democratic-nondemocratic partitions. Afrobarometer is an independent, not-for-profit organization that conducts opinion polls on social, political, economic, and international issues across more than 30 African countries. The survey samples are nationally representative, comprising either 1,200 or 2,400 respondents per country, per survey round. The survey questions are standardized but are periodically updated. For this study, I ensure that all questions used remain consistent across all countries and survey rounds to allow for reliable cross-border comparisons.

In the survey data I glean and compile information on respondents belonging to partitioned ethnic groups. Although Afrobarometer survey data provides detailed ethnicity information, the names of ethnic groups do not always match with those of the Murdock's map. To ensure accuracy, I cross-reference the names of the 45 major partitioned ethnic groups from Murdock's ethnic map with alternative names found in Encyclopedia Britannica, Oxford Reference, and Joshua Project. This approach allows me to accurately match ethnic groups in the Afrobarometer data.

I focus on five key socioeconomic outcomes from the survey data:

1. Economic Insecurity: I construct an economic insecurity (econins) index which captures the frequency with which people face shortages of essential needs. Afrobarometer asks respondents how often they or their families experience shortages of food, clean water for home use, medicines or medical treatment, fuel for cooking, and cash income over the past year. The question is framed as: *Over the past year, how often, if ever, have you or anyone in your family: Gone without ...* . Respondents choose from five possible answers: 0 = never, 1 = just once or twice, 2 = several times, 3 = many times, and 4 = always. For each respondent i, I calculate the economic insecurity index as the average of their responses to these five questions. To make the index more interpretable, I standardize it on a 0–1 scale and then multiply it by 100 ($standardized\ econins_i = \frac{econins_i}{4} \times 100$). Thus, the index is expressed in percentage points, where higher values indicate greater economic insecurity.

2. Subjective Wellbeing: I complement the economic insecurity index with a measure of subjective wellbeing, which reflects individuals' perceptions of their current living conditions. Afrobarometer asks respondents: *In general, how would you describe: Your own present living conditions?* The response options are 1 = Very bad, 2 = Fairly bad, 3 = Neither good nor bad, 4 = Fairly good, 5 = Very good. I define subjective wellbeing as a binary variable that takes a value of 1 if a respondent rates their living condition as fairly good or very good, and 0 otherwise.

3. Human Capital: I also look at respondent's human capital, proxied by educational

attainment. Afrobarometer codes respondents' education levels on a scale from 0 to 9, where 0 indicates no formal education and 9 represents postgraduate education. For simplicity, I create a binary variable for education that equals 1 if a respondent has completed at least secondary education and 0 otherwise.

4. Employment: Another variable examined is employment status. The survey question specifically asks about waged employment status: *Do you have a job that pays a cash income? [If yes, ask] Is it full-time or part-time? [If no, ask:] Are you presently looking for a job.* The possible responses are 0 = No, not looking, 1 = No, looking, 2 = Yes, part time, 3 = Yes, full time. I define employment as a binary variable that takes a value of 1 if the respondent is employed either part-time or full-time in a waged job, and 0 otherwise.

5. Access to Public Goods: Finally, I examine respondents' access to public goods. Afrobarometer interviewers record the presence of various public goods and amenities within a walking distance (usually in the primary sampling unit) from the respondent's location. I focus on the following four key public goods, which are most likely provided by the government: electricity, piped water, paved road, and sewage system. Access to these public goods serves as an important indicator of government performance and infrastructure development.

Summary Statistics: Table 3 presents the summary statistics from the Afrobarometer survey data. The sample comprises individuals belonging to partitioned ethnic groups residing within 50 km of the democratic-nondemocratic borders. The sample size ranges from 6,989 to 7,022 respondents, and it is roughly balanced with respect to gender distribution. However, given the subnational focus of the sampling area, a significant portion of the respondents (about 58 percent) reside in rural areas.

Among the five components of economic insecurity, cash income shortages are the most frequently reported, followed by shortages of medical care. In contrast, cooking fuel is the least frequently lacked item. Despite these differences, the components of economic insecurity exhibit strong positive pairwise correlations, indicating that respondents who lack one basic necessity are likely to lack others as well. The strongest correlation is between cash income and medical care shortages (0.51), suggesting that lack of income often prevents individuals from accessing medical services. The weakest correlation is between access to clean water and cooking fuel (0.34).

Overall, economic insecurity in the sample is moderate, with a mean score of 35.71, on a 0–100 scale. However, subjective wellbeing is notably lower, as only 28.6 percent of respondents report having fairly good or very good living conditions. This indicates that lower levels of economic insecurity do not necessarily translate into higher subjective wellbeing, which justifies investigating these variables separately. Educational attainment is also

relatively low, with only 22 percent of respondents having completed at least secondary education. Similarly, waged employment is limited, as only about one-third of respondents report holding a part-time or full-time job that pays a cash income.

Turning to public goods provision, electricity is the most accessible public good, with 64 percent of respondents reporting access to the national grid. Piped water is the second most accessible amenity, with 57 percent of respondents living within a walking distance of a piped water source. However, access to sewage systems remains low, indicating a significant gap in sanitation infrastructure.

Comparing the mean statistics between the democratic and nondemocratic sides of the borders reveals significant disparities in socioeconomic conditions. Respondents on the democratic sides fare significantly better than their counterparts on the nondemocratic sides. Economic insecurity, for example, is about 12.4 pp lower on the democratic sides. Subjective wellbeing, employment and educational attainment are all higher on the democratic sides of the borders. Access to public goods is also better on the democratic sides, particularly for electricity and piped water.

Table 3: Summary Statistics of Individual-level Data

	Whole Sample					Democratic Partitions			Nondemocratic Partitions		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	N	mean	min	max	sd	N	mean	sd	N	mean	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 showing the impact of democratization on subnational development. I begin by reporting the results from the grid cell-level panel fixed effects estimation, followed by the regression discontinuity (RD) estimates.

V.I Panel Fixed Effects Estimates

The panel fixed effects estimates of the impact of democratization on subnational development within partitioned ethnic homelands are presented in table 4. Columns (1) to (3) examine the relationship between subnational development and the liberal democracy index, while columns (4) to (6) focus on the effects of being in a democratic regime. I report estimates using three forms of nighttime light data including binary-transformed light density, mean light density, and log light density.

Panel A presents estimates from my preferred sample, which includes grid cells within a 50 km radius of the border. This allows for a more localized comparison of development outcomes and reduces bias. Across all specifications in Panel A, both the continuous measure of democracy (libdem index) and the binary measure of democratic transition show statistically significant positive effects on nighttime light density. The estimate in Column (1) suggests that a full-range increase in the liberal democracy index, from 0 to 1, is associated with a 16 pp increase in the probability of grid cell having light at night – a substantial development gain, particularly in the context of African border regions. Similarly, the estimate in Column (4) shows that being in a democratic regime, relative to a nondemocratic regime, raises the probability of a grid cell having light by approximately 3.5 pp. These findings imply that democratic reforms substantially increase local economic activity and/or development.

Panel B reports results from the full sample of partitioned ethnic groups. This exercise allows me to test the robustness of the results to a wider window. The results remain consistent, although the coefficients are larger, likely reflecting broader variations, including more rural or less-developed areas within the full sample.

V.II RD Estimates of Subnational Development Disparities

Before presenting the RD estimates, I first examine the trends in nighttime light density across democratic and nondemocratic partitions. This preliminary step is important because I report yearly RD estimates to track how development differences evolved over time between these two sets of regime type.

Figures 9a and 9b display the yearly mean probabilities of a grid cell being lit at night within a 50 km radius and across the entire sample of partitioned ethnic groups, respectively. Two

key patterns emerge from these figures. First, during the early years of democratization, the probability of having light at night was similar on both sides of the border. This similarity is especially evident within the 50 km radius sample. For instance, in 1994, the average probability of a grid cell being lit was 0.08 on the democratic side and 0.07 on the nondemocratic side. The second key observation is that, starting from 1995, democratic partitions began to record significantly more light over time, indicating faster development on these sides of the borders. While the trends on both sides show similar slopes, the democratic sides clearly developed at a faster pace.

I now turn to the RD estimates to quantify these disparities. Figures 10a and 10b present these estimates.[13] The outcome variable is binary, taking a value of one if a grid cell is lit and zero if it is not. Using a binary outcome helps mitigate the influence of outliers and simplifies interpretation since nighttime light data lacks a standard unit of measurement.

The top panel of Figure 10a shows the RD estimates within the 50 km radius from the border. The results closely mirror the preliminary patterns discussed earlier. In the early years of democratization, the development levels on both sides of the border were similar. The coefficient estimates for 1992 and 1993 are small and statistically insignificant, confirming that there was no significant difference in lighting during this period. Over time, however, the estimates gradually increased in both size and significance. By 2013, the average democratic partition had about a 7 pp higher probability of being lit compared to its nondemocratic counterpart. This impact is substantial given the subnational context. To put it in perspective, the sample mean probability of a grid cell being lit is 0.19, so a 7 pp increase represents an improvement of approximately 37 %. The bottom panel presents RD estimates for the entire sample of partitioned ethnic groups, and the results are consistent with those from the narrower 50 km window. This consistency suggests that the main findings are not driven by the choice of neighborhood size.

To further illustrate these results, I pick two partitioned ethnic groups, the Adele and the Ambo (the first two from appendix table A1), and show how their lighting patterns changed over time. Figures 11a to 11c display the lighting patterns for the Adele group, who are split between Ghana (a democracy) and Togo (a nondemocracy), with 48 percent and 52 percent of their land falling on each side of the border, respectively. In 1992, neither side of the Adele partition had any lit grid cells. However, over time, some grid cells on the Ghanaian side became lit, while the Togolese side remained entirely unlit.

The Ambo case is shown in figures 11d to 11f. This group is split between Angola (a nondemocracy) and Namibia (a democracy) in a 41 percent and 59 percent ratio. Unlike the Adele group, both sides of the Ambo partition had some lit grid cells in 1992. Over time, both sides experienced an increase in lit grid cells, but the Namibian side (the democratic

[13] For ease of visualization, estimates for most odd years are excluded.

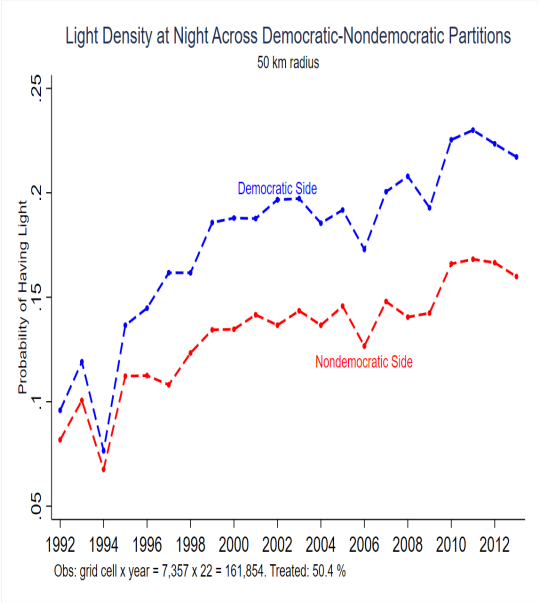
partition) recorded a much greater number of new lit areas compared to the Angolan side.

These case studies highlight an important takeaway: while development is possible without democratization, the pace of development is noticeably faster in democratic settings. The lack of democratic governance appears to slow the progress of development.

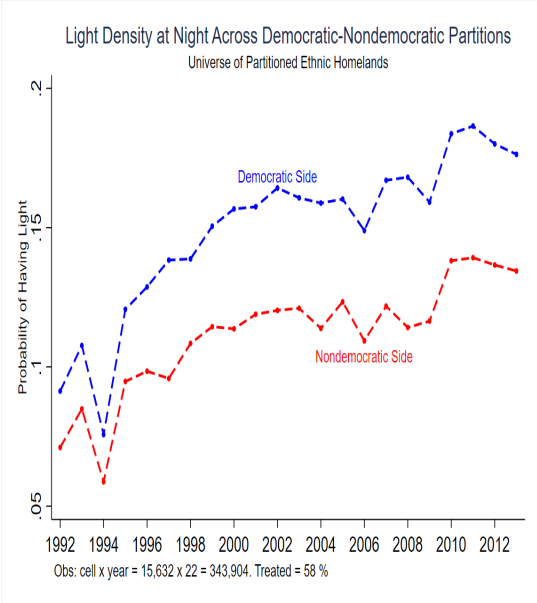
Table 4: Impact of Democratization on Light Density at Night

	(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. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

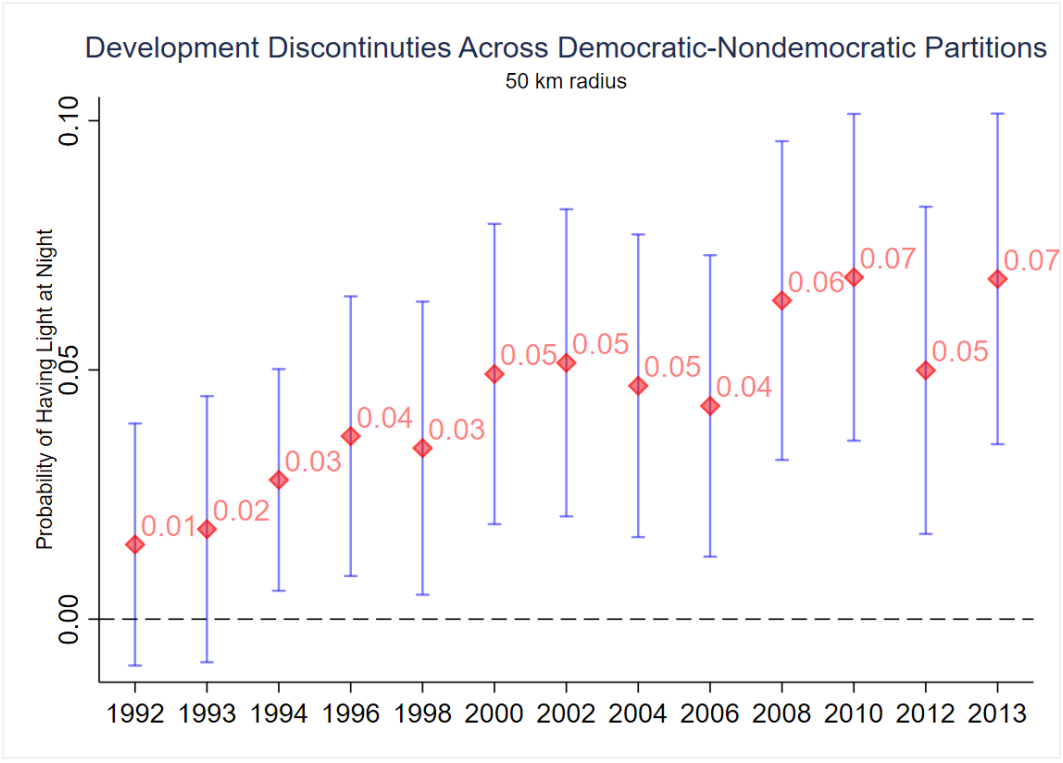


(a)

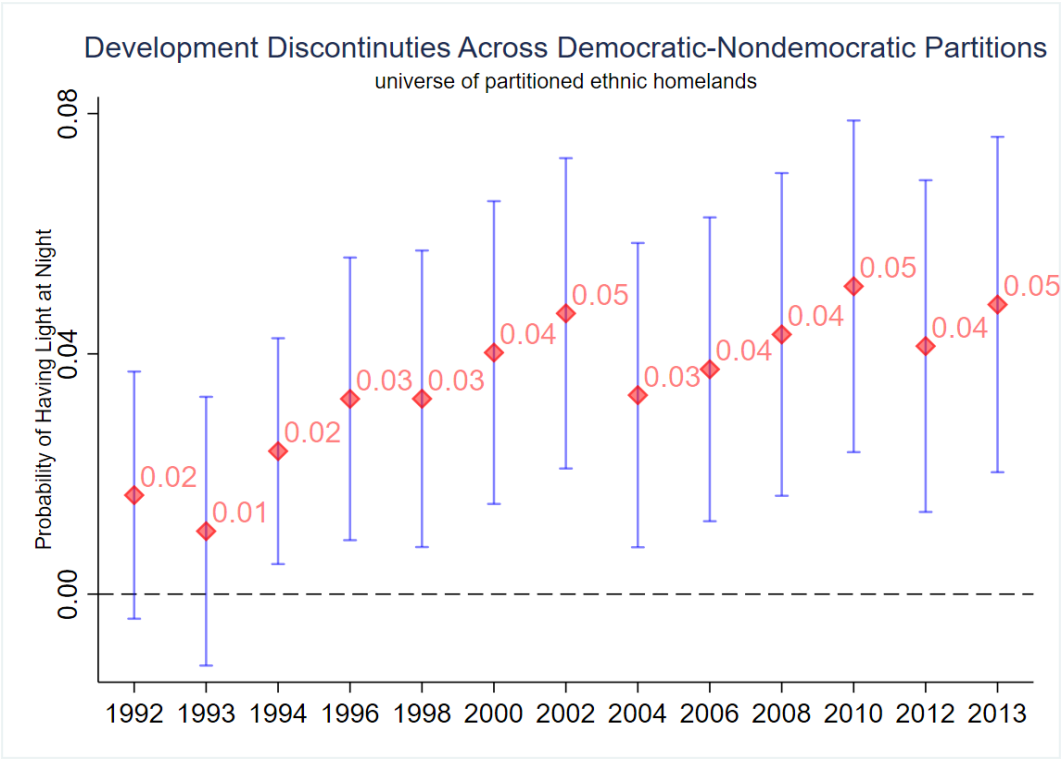


(b)

Figure 9: The figures display the yearly mean probabilities of a grid cell having light at night within democratic-nondemocratic partitions. The left panel shows the trends for grid cells within 50 km radius whereas the right panel shows for the universe of democratic-nondemocratic partitions.

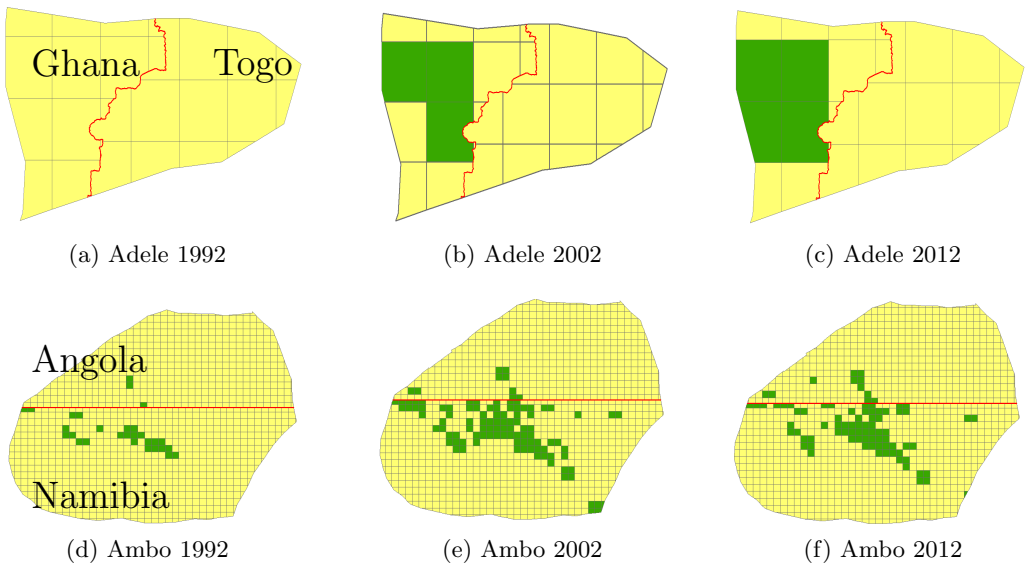


(a)



(b)

Figure 10: 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 whereas the bottom panel displays estimates from a 100 km radius. All models include ethnicity fixed effects.



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

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

Figure 11: The figures display the decadal changes in lit (green) and unlit (yellow) grid cells for two samples of partitioned groups that reside astride borders diving a consolidated democracy and a nondemocracy. The top three figures represent the Adele who reside across the Ghana-Togo border while the bottom three show the Ambo group on the Angola-Namibia border. The red lines is the contemporary borderlines dividing these groups into a democracy and a nondemocracy. In the top panel the democratic side is Ghana whereas it is Namibia in the bottom panel

V.II.I Sensitivity Checks

I test the robustness of my main RD estimates using a variety of alternative specifications and checks. I still focus on the 50 km radius around the borders. Where results are presented in tables, I omit estimates before 1996 to ensure the results fit the page.

1. Changing the Dependent Variable: I replace the binary light outcome with grid cells' mean light density. This alternative specification examines whether my main results hold when using a continuous measure of nighttime light instead of a binary one. The estimates, presented in appendix figure A1, confirm that the main findings remain robust. The estimated development disparities across democratic and nondemocratic partitions were initially small and statistically not significant, but grew steadily over time. The estimate for 2013 indicates that being in a democratic partition increases a grid cell's mean nighttime light by about 64 % above the mean (0.50).

I also conduct additional checks (unreported) using the natural logarithm of light density and a sine-transformed version of the light data to account for potential skewness in the distribution. In both cases, the results are consistent with my main findings, indicating that the observed development disparities are not dependent on the specific transformation of the dependent variable.

2. Covariates: In this exercise I condition the estimates on a set of local geographic and

location-specific covariates. In regression discontinuity designs, including covariates in a narrow neighborhood primarily improves the precision of the estimates rather than causing substantial changes in the coefficients. This check ensures that the observed development disparities are not driven by unobserved geographic or environmental factors that might vary systematically across borders.

The results, presented in appendix figure A2, show the RD estimates of development discontinuities conditional on several location and geography controls, including distance to the nearest river (in km), distance to the seacoast (in km), average annual precipitation (in mm), elevation (in meters), slope (in degrees), and the log of grid cell size.[14]

The inclusion of these covariates leads to an improvement in precision, reflected in narrower confidence intervals (standard errors are not reported in the figure). However, the point estimates remain consistent with the baseline results, suggesting that my main findings are robust to the inclusion of additional controls. The stability of the coefficients implies that the baseline estimates are unlikely to be biased by omitted variables or confounding geographic factors.

3. Population Density: Nighttime light density reflects human settlements and economic activities. This implies that uninhabited areas, by definition, are unlikely to have lights. Thus, population clustering or settlement patterns could potentially confound my estimates. If democratic and nondemocratic partitions differ systematically in terms of population distribution, my results could be biased since development disparities would be attributed to democratization rather than to underlying differences in population density. To address this concern, I control for population density in my RD specification. This adjustment ensures that the observed development differences across democratic and nondemocratic partitions capture variations in socioeconomic development beyond differences in human activity or settlement patterns.

There are two approaches to incorporating population density. First, I could include log-transformed population density as a covariate while using log-transformed light density as the dependent variable. Alternatively, I could adopt a binary approach, where both population density and light density are transformed into binary indicators, capturing whether a grid cell is inhabited and whether it has light at night. I prefer the log-log specification, as it more precisely captures continuous variations in population distribution and human activity. The binary-binary approach yields similar results, however.

For population density data, I use the United Nations' gridded population dataset, which is derived from national censuses and interpolated to provide consistent coverage across time and space. To account for potential historical differences in settlement patterns, I

[14] I include log grid cell size as a control because, while all grid cells should have same size, those near coastlines or borders tend to be smaller due to geographic truncation.

control for population densities in both 1960 (time of political independence) and 1990 (start of democratization wave). These benchmarks are particularly relevant because 1960 marks the beginning of state-building efforts in many African countries, while 1990 captures population distributions before political regimes began to diverge. By jointly controlling for these two time points, I mitigate the risk that my estimates are confounded by historical or post-colonial development disparities.

The results from this exercise are reported in appendix figure A3. The main patterns remain unchanged. During the early years of democratization (1992 and 1993), the RD estimates are small and not statistically significant. However, starting from 1994, the estimates increase in magnitude and become statistically significant. These findings suggest that the documented development differences across democratic and nondemocratic partitions are not driven by population clustering or settlement patterns, nor by historical disparities in population distribution or development.

4. Two-dimensional RD: To account for spatial variation more flexibly, I implement a two-dimensional RD specification. Letting $x = longitude$ and $y = latitude$ I expand equation 3 to include a polynomial function of these geographic coordinates. Specifically, I include the terms $x + y + x^2 + y^2 + xy + x^3 + y^3 + x^2y + xy^2$, following the approach of (Dell, 2010). Since grid cells are spatially identified by their latitude-longitude coordinates, this specification controls for units' precise spatial characteristics, addressing the potential influence of geographic factors that may vary systematically across borders.

The two-dimensional specification is more flexible compared to a unidimensional distance-based RD design, as it accounts for curvature and localized variations along the border. However, this added flexibility comes with the risk of overfitting, particularly when the estimation is conducted in a narrow neighborhood around the border. Overfitting can capture noise rather than true underlying patterns.

Despite these concerns, my estimates remain robust to this specification. The results, reported in Panel A of appendix table A3, show that the main patterns of development disparities across democratic and nondemocratic partitions persist. The estimated coefficients remain similar to those obtained from the simpler distance-based RD specification, suggesting that my primary findings are not driven by misspecification of the spatial relationship between latitude, longitude, and development outcomes.

5. Ethnic Partition-specific Slopes: In the baseline RD specification, I apply a common slope to all ethnic partitions on each side of the border. However, this approach assumes that development trends vary uniformly across different ethnic homelands and/or partition, which may not hold in practice. To address this, I allow for ethnic partition-specific slopes, assigning separate slopes to each of the 45 split ethnic groups on both sides of the border,

resulting in a total of 90 distinct slopes.

Since ethnic groups occupy different geographic spaces, this adjustment also accounts for potential spatial heterogeneities within and between partitioned ethnic homelands. By allowing for ethnicity-specific slopes, I control for these group-specific differences, thereby reducing the risk of bias stemming from unobserved within-group factors.

Despite this more flexible parametrization, the results remain robust. As shown in Panel B of appendix table A3, the main development disparities between democratic and nondemocratic partitions persist. The point estimates remain similar to those obtained from the baseline specification, confirming that the observed effects are not driven by uniform slope assumptions across all partitions.

6. Optimal MSE Bandwidth Estimators: To further test the robustness of my RD estimates, I use optimal mean squared error (MSE) bandwidth estimators with a triangular kernel. These bandwidth selectors adjust the size of the neighborhood around the border, balancing the trade-off between bias and variance to optimize the precision of the estimates. I report results from three bandwidth selection methods, namely conventional, bias-corrected, and robust bias-corrected estimators.

Panel C of appendix table A3 shows the results from these estimators. The main findings remain consistent across all bandwidths. The estimated development disparities between democratic and nondemocratic partitions remain statistically significant for most years, particularly from the mid-1990s onward. The only exceptions occur in the earliest years, 1992 and 1993 (not shown in the table), when all three estimators produce jointly insignificant estimates. These findings suggest that my baseline results are not driven by arbitrary choices of neighborhood size.

7. Different Democratic Classification: Lastly, I test the robustness of my results by using an alternative criterion to classify countries as consolidated democracies or nondemocracies. My baseline classification incorporated the libdem index, which emphasizes the liberal dimension of democracy. Since the threshold I used for the libdem index was somewhat arbitrary, I now exclude it and classify a country as a consolidated democracy if it has been consistently coded as a *democracy* since the 1990s. Recall that a country is coded as a *democracy* if its Polity2 score is greater than *zero* and its Freedom House rating is at least *partly free*.

Under this new classification, five additional countries qualify as consolidated democracies: Lesotho, Malawi, Mozambique, Nigeria, and Zambia. Since Lesotho is entirely enclosed by South Africa, it is excluded from the analysis, leaving a total of nine consolidated democracies sharing land borders with eleven nondemocratic neighbors. The new democracy-nondemocracy borders are illustrated in appendix figure A4. These updated borders parti-

tion 117 ethnic groups, with the major partitions accounting for roughly 73 percent of the total (85 groups).

The results from this exercise, presented in appendix figure A5, show that the point estimates decrease compared to the baseline results, but the main patterns remain unchanged. The reduction in effect size is expected because this classification includes frail democracies that are compared against nondemocracies. For instance, Mozambique is classified as a democracy under this criterion but is paired with Zimbabwe, a nondemocracy. As a result, this comparison is less stark than those involving top-performing democracies. Nevertheless, the estimates remain economically meaningful. The point estimates for 2012 and 2013, for example, represent a 38 percent increase in the probability of a grid cell being lit at night relative to the outcome mean.

Additionally, I consider an alternative classification that divides countries based on their median libdem score (0.223) during the sample period. Under this criterion, countries scoring above the median are treated as democracies, while those scoring below it are classified as nondemocracies. Interestingly, this threshold yields the same set of countries as the current sensitivity check. Therefore, the baseline results are robust to using a median-based threshold for the libdem index.

V.III RD Estimates of Individual-level Disparities

I now turn to individual-level disparities in socioeconomic outcomes across democratic and nondemocratic partitions. Table 5 presents the results, with Panel A reporting estimates from the preferred 50 km radius sample and Panel B showing estimates from the full sample of partitioned ethnic groups.

The results in Panel A indicate that residing on the democratic side of a partitioned ethnic homeland is associated with significantly improved socioeconomic wellbeing. For instance, economic insecurity is reduced by nearly 23.5 pp on a 0–100 scale for residents on the democratic side of the border. This reduction corresponds to a 66 % drop in economic insecurity relative to the sample mean. Subjective wellbeing also improves significantly for individuals residing on the democratic side of the border, increasing by approximately 26 % above the outcome mean. The estimates in columns (3) and (4) also indicate that residents on the democratic sides are more likely to have completed at least secondary education and to be employed in waged jobs. These findings suggest that democratic regimes reduce people's economic insecurity and enhance overall life satisfaction by improving access to education and creating employment opportunities.

Access to public goods follows a similar pattern. Residing on the democratic side increases the probability of having access to paved road, electricity and sewage system by 11.5, 21.5

and 11.1 pp respectively. However, the coefficient for access to piped water is not statistically significant, although it has the expected positive sign.

Panel B presents estimates of these disparities for all members of partitioned ethnicities, regardless of their current place of residence. The sample size in this panel is more than double that of Panel A, which should provide a broader perspective on the disparities for members of partitioned ethnic groups. The results in Panel B largely mirror those in Panel A. All estimates are statistically significant, indicating better living conditions on the democratic sides of borders.

There are two possible explanations underlying the consistency of the results shown in Panels A and B. First, expanding the bandwidth does not appear to introduce significant variation in the socioeconomic characteristics of individuals matched across the border. In other words, individuals being compared remain relatively similar in terms of their underlying socioeconomic wellbeing even as the sample size increases. This is because the variations in the within-ethnicity RD design stem from matching individuals of the same ethnicity who experience different political regimes.

Second, the results suggest that migration across the borders does not systematically bias the estimates. If individuals from partitioned ethnicities who migrate to the democratic side had substantially better socioeconomic conditions than those who remain on the non-democratic side, one would expect larger disparities when expanding the sample to include more distant individuals. However, the similarity of the estimates across Panels A and B indicates that any potential biases from selective migration likely cancel each other out. In other words, both in-migration to democratic areas and out-migration from nondemocratic areas seem to contribute similarly to the observed disparities, thereby reducing the likelihood of migration-based confounding.

Overall, these results demonstrate that democratization has tangible and positive effects on individual-level outcomes. It improves economic security, wellbeing, education, employment, and access to essential public goods.

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 experienced a significant wave of democratization in the early 1990s, with almost all countries holding competitive, free, and fair elections by 1997. This shift was driven not only by a desire for political freedoms but also by the need to foster economic growth in a region long plagued by authoritarian regimes and underdevelopment. This study investigates whether Africa's democratization wave has indeed delivered economic and developmental benefits.

The study is broadly divided into two parts. In the first part I use a dynamic panel fixed effects model to examine the impact of democratization on economic performance. I find that democratization significantly increases income per capita. A 10 % improvement in the liberal democracy index raises GDP per capita by about 1.3 %, while being in a democratic regime, as opposed to being in a nondemocratic regime, increases income per person by 1.2 %. I test the mechanisms via which Africa's democratization could have affected income and find that democracy increases physical and human capital, foreign capital inflows, economic liberalization, and trade openness. I also show that these income gains are not merely a by-product of structural adjustment programs implemented across Africa during the 1980s.

In the second part of the study, I try estimating the impact of democratization on long-run development by exploiting African borders that split same ethnicity into democracies and nondemocracies. I am able to group African countries into consolidated democracy and nondemocracy (or failed democracies) because some countries quickly reverted back to nondemocracies after their initial democratic takeoffs in the early 1990s. Confiding the analysis to a sample of democratic-nondemocratic ethnic partitions, I first look at the impact of democratization on subnational development using panel fixed effects estimation at the grid cell level. Grid cells are assigned with their respective country's annual democratic scores and classifications. I find a robust positive impact of democratization on subnational development as proxied by light density at night. Specifically, a one-point increase in the liberal democracy index increases the probability that a grid cell has light at night by 16 percentage points (pp) while democratic periods, relative to nondemocratic periods, are associated with 3.5 pp increase.

I then use a within-ethnicity regression discontinuity design to compute development disparities across democratic-nondemocratic ethnic partitions. To the extent that groups astride borders are similar in all respects except political regime type, this specification computes the causal effects of democratization on development outcomes. In this exercise I find that during the early years of democratization, development levels were similar on both sides of the borders. However, democratic areas recorded faster development over time, creating a strong, persistent divergence. By 2013, democratic partitions were 7 pp more likely to have

nighttime lights than their nondemocratic counterparts. These results are robust across multiple sensitivity checks and pass a falsification test using a placebo border.

Additionally, I compile individual-level data for members belonging to partitioned ethnicities and compute disparities in socioeconomic outcomes. I find that members of partitioned ethnic groups on the democratic sides enjoy better living conditions compared to their counterparts on the nondemocratic sides. Specifically, they exhibit lower levels of economic insecurity, report higher life satisfaction, more likely to be wage employed, more educated, and have better access to public goods.

In Appendix B, I conduct a case study of the Ghana–Togo border to provide more granular evidence on the impact of democratization on human development. The results show that Ghana's permanent transition to democracy led to a one-year increase in schooling and a 7 pp increase in access to formal education among post-democratization cohorts. Furthermore, I conduct a falsification analysis to further show that my results are driven primarily by differences in political regime type.

References

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

Acemoglu, D. and Robinson, J. A. (2001). A theory of political transitions. *American Economic Review*, 91(4):938–963.

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.

Ake, C. (1996). *Democracy and Development in Africa*. Brookings institution press.

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

Arriola, L. R., Rakner, L., and van de Walle, N. (2023). *Democratic Backsliding in Africa?: Autocratization, Resilience, and Contention*. Oxford University Press.

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. (1996). Democracy and growth. *Journal of economic growth*, 1:1–27.

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.

Berg-Schlosser, D. (1984). African political systems: Typology and performance. *Comparative Political Studies*, 17(1):121–151.

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. (1998). Second elections in africa. *Journal of Democracy*, 9(3):51–66.

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

Brückner, M. and Ciccone, A. (2011). Rain and the democratic window of opportunity. *Econometrica*, 79(3):923–947.

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 Research*, 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.

Epstein, D. L., Bates, R., Goldstone, J., Kristensen, I., and O'Halloran, S. (2006). Democratic transitions. *American journal of political science*, 50(3):551–569.

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.

Gerring, J., Bond, P., Barndt, W. T., and Moreno, C. (2005). Democracy and economic growth: A historical perspective. *World politics*, 57(3):323–364.

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.

Haggard, S. and Kaufman, R. R. (1995). *The Political Economy of Democratic Transitions*. Princeton University Press, Princeton, NJ.

Harding, R. and Stasavage, D. (2014). What democracy does (and doesn't do) for ba-

sic services: School fees, school inputs, and african elections. *The Journal of Politics*, 76(1):229–245.

Helliwell, J. F. (1994). Empirical linkages between democracy and economic growth. *British journal of political science*, 24(2):225–248.

Herbst, J. (1990). The structural adjustment of politics in africa. *World Development*, 18(7):949–958.

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

Hoeffler, A. (2002). The augmented solow model and the african growth debate. *Oxford Bulletin of Economics and Statistics*, 64(2):135–158.

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.

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.

Madsen, J. B., Raschky, P. A., and Skali, A. (2015). Does democracy drive income in the world, 1500–2000? *European economic review*, 78:175–195.

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.

Murtin, F. and Wacziarg, R. (2014). The democratic transition. *Journal of economic growth*, 19:141–181.

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.

Persson, T. and Tabellini, G. (2009). Democratic capital: The nexus of political and economic change. *American Economic Journal: Macroeconomics*, 1(2):88–126.

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.

Ravenhill, J. (1980). Comparing regime performance in africa: The limitations of cross-national aggregate analysis. *The Journal of Modern African Studies*, 18(1):99–126.

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

Rodrik, D. (1990). How should structural adjustment programs be designed? *World development*, 18(7):933–947.

Rodrik, D. and Wacziarg, R. (2005). Do democratic transitions produce bad economic outcomes? *American Economic Review*, 95(2):50–55.

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

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.

World Bank, . (1989). Sub-saharan africa: From crisis to sustainable growth. a long-term perspective study. Technical report, The World Bank, Washington, DC.

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

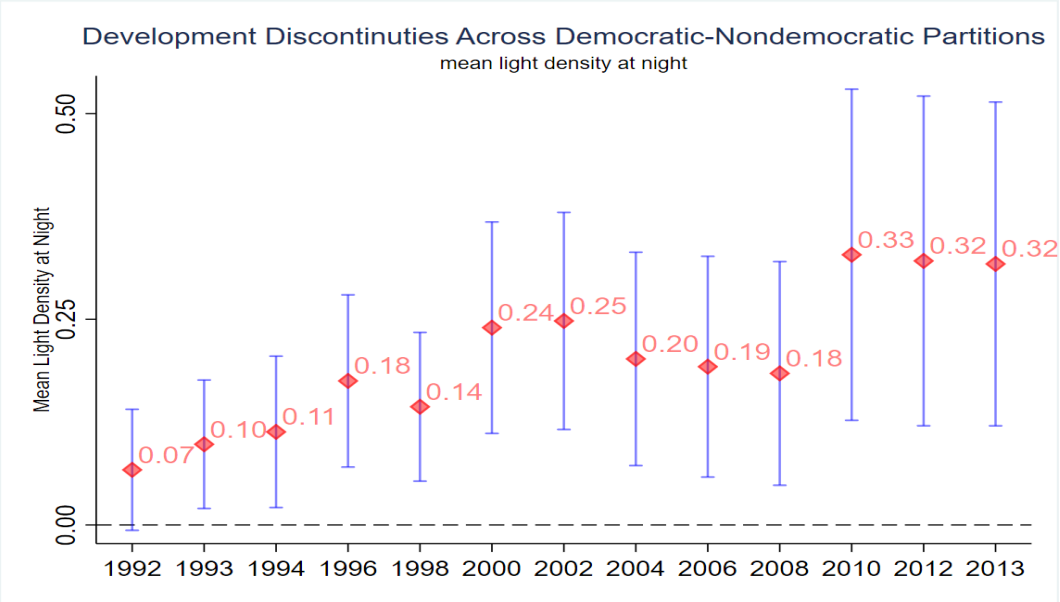
	50 km			100 km		
	age	female	rural	age	female	rural
treated	-0.260	-0.001	0.1003***	-1.571*	0.007	0.288***
	(0.609)	(0.022)	(0.021)	(0.855)	(0.031)	(0.030)
Obs.	6,989	7,022	7,022	10,231	10,275	10,275
R-sq.	0.003	0.000	0.016	0.004	0.000	0.034

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. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

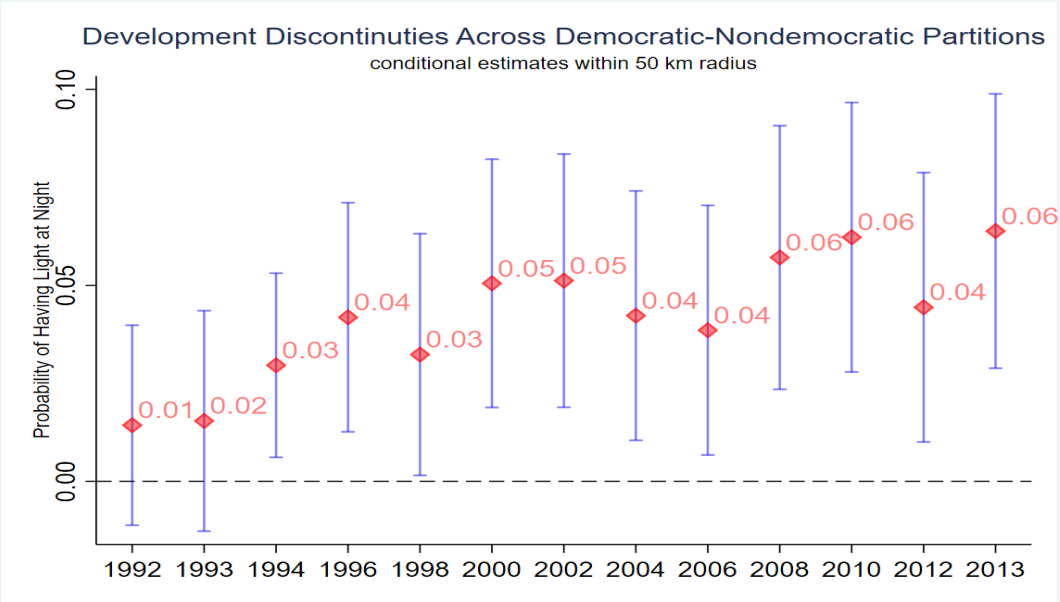
Appendix Table A3: Sensitivity Checks

	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

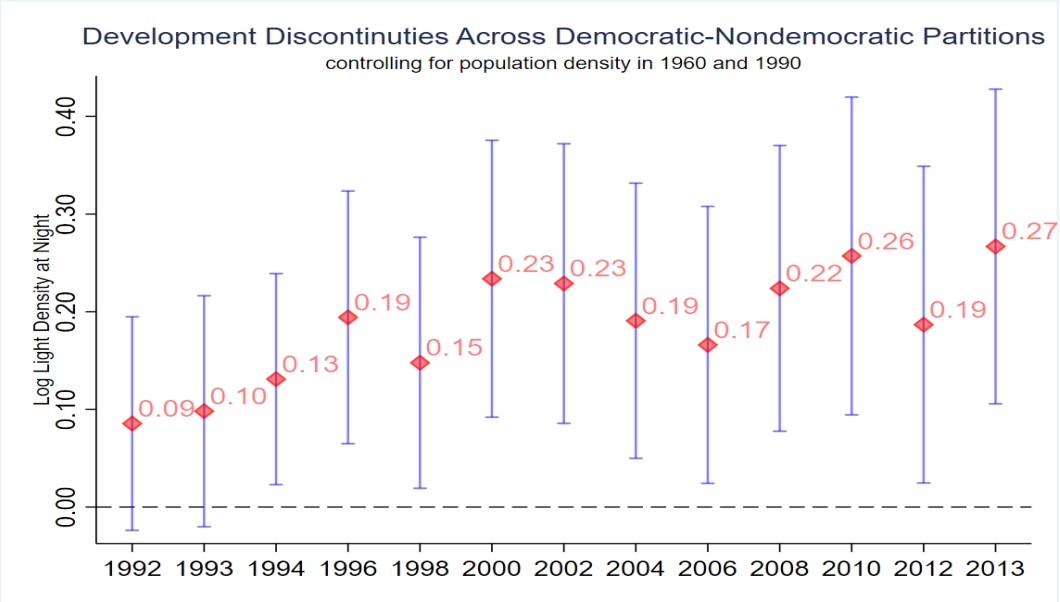
The table displays the results from the sensitivity checks of the baseline results showing the development disparities across democratic-nondemocratic partitions. The model in Panel A uses a two dimensional RD whereas the one in Panel B assigns unique slopes to each partitioned ethnicity along a border. 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. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$



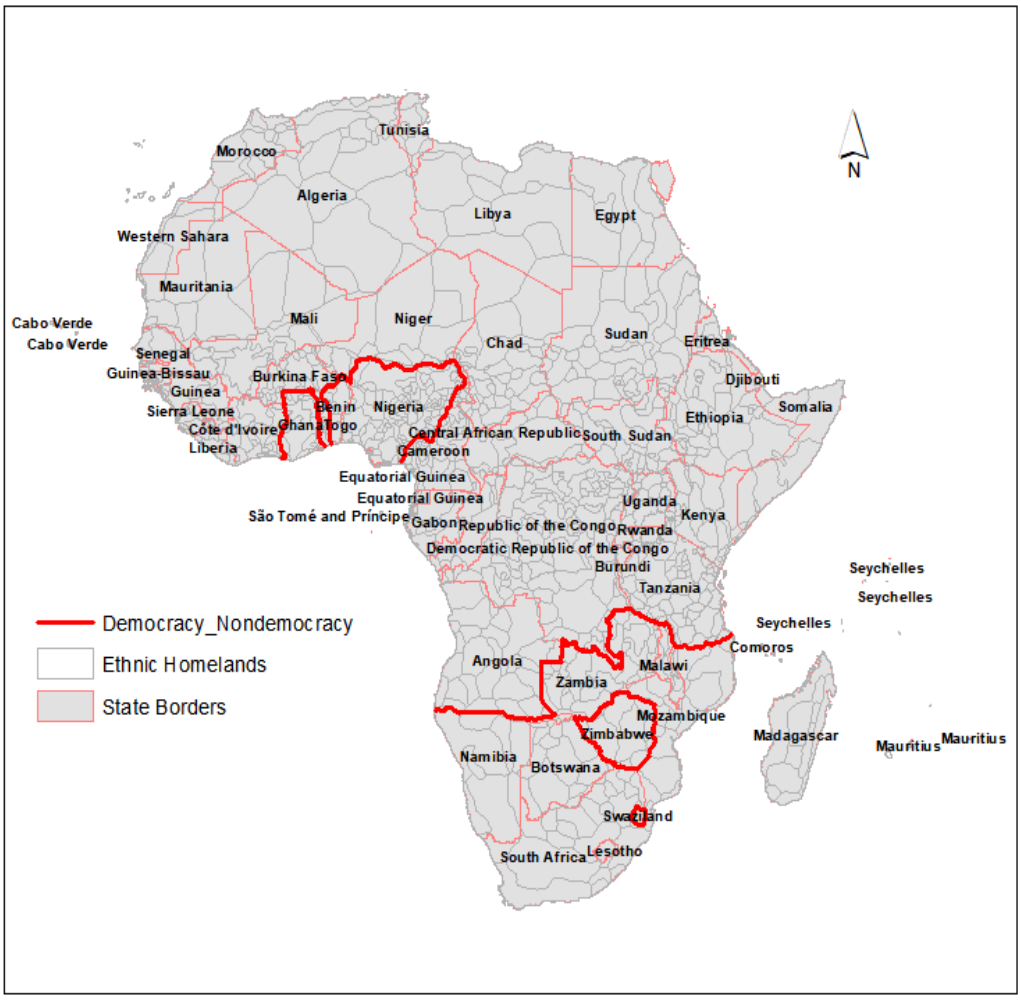
Appendix Figure A1: The figure shows the RD estimates of the development discontinuities across democratic-nondemocratic partitions. The dependent variable is mean light density at night. Standard errors are clustered at the grid cell.



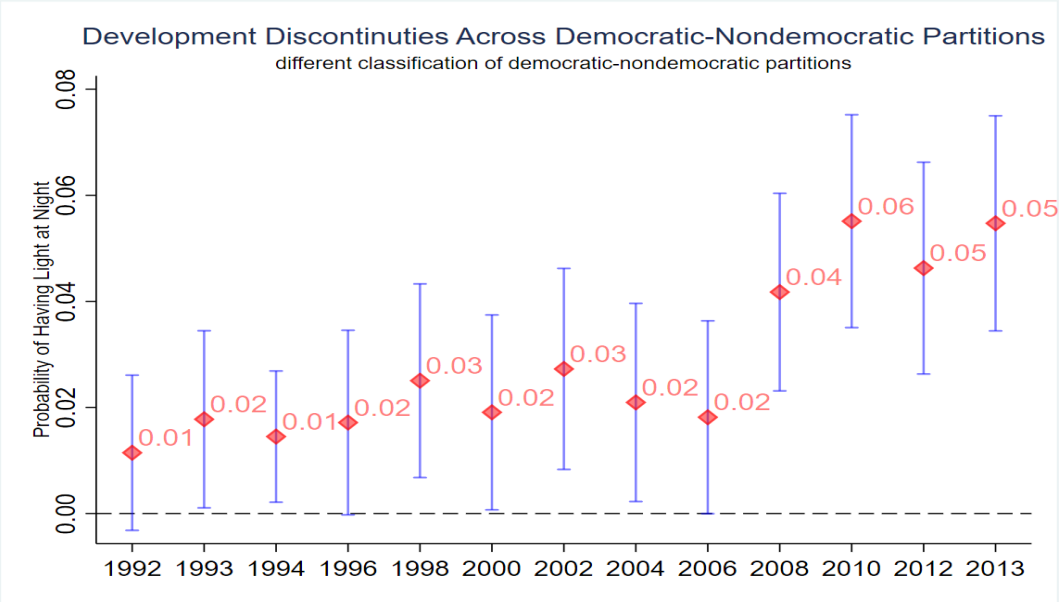
Appendix Figure A2: The figure shows conditional RD estimates of the development discontinuities across democratic-nondemocratic partitions. The dependent variable takes a value one if a grid cell has light and zero otherwise. The controls are distance to river, distance to seacoast, mean elevation, mean precipitation, slope, and grid cell size. Standard errors are clustered at the grid cell.



Appendix Figure A3: The figure shows RD estimates of the development discontinuities across democratic-nondemocratic partitions controlling for log population densities in 1960 and 1990 (ln population = ln(0.01 + population density)). The dependent variable is log light density lny = ln(0.01 + mean light). Standard errors are clustered at the grid cell.



Appendix Figure A4: The figure displays ethnic homelands and the contemporary state borders that divide ethnicities into democracies and nondemocracies. A weaker classification of consolidated democracy is used in this scenario.



Appendix Figure A5: The figure shows the RD estimates of the development discontinuities across democratic-nondemocratic partitions. In this exercise I use a weaker classification of consolidated democracy to test the robustness of my main results. The dependent variable takes a value one if the grid cell has light and zero otherwise. Standard errors are clustered at the grid cell.

B Further Evidence & Falsification Analysis

In this section, I provide further evidence of the impact of democratization on human development by conducting a case study of the Ghana-Togo border. To strengthen the causal interpretation of my results, I also conduct a falsification test using a placebo border.

The Ghana-Togo border is a particularly suitable setting to test the impact of democratization on human development. It separates one of Africa's most improved democracies, Ghana, from a long-standing nondemocratic regime, Togo. Between 1990 and 2018, Ghana recorded the most impressive performance on the Liberal Democracy Index (libdem) among African countries. As shown in figure B1, Ghana's score increased from 0.097 in 1990 to 0.63 in 2018, compared to an average increase from 0.153 to 0.310 for the continent. In contrast, Togo's libdem score rose by just 0.175 points over the same period, moving from 0.067 to 0.242. Throughout my sample period, Togo experienced no democratic episodes and has been ruled by a single family since 1967.

In addition to the stark contrast in political regimes, the Ghana-Togo border has an advantage in terms of arbitrariness. The border partitions approximately 15 ethnic groups, with 11 of them classified as major partitions. These groups also vary significantly in their levels of ethnic political centralization. For instance, while the Dagombas are highly centralized, other groups, such as the Ewe and Mamprussi, have paramount kingdoms, and some, like the Konkombas, have no centralized authority. This variation in pre-colonial political structures provides a representative context for examining the long-term impact of democratization on human development outcomes across different institutional and cultural settings.

BI Democratization and Human Development

To investigate whether democratization improves human development, I focus on two key measures, namely access to formal education and years of schooling. My identification strategy leverages a comparison of birth cohorts on either side of the Ghana-Togo border, before and after Ghana's democratic transition in 1992. I use the household member recode from DHS 2014 standard survey. The sample covers individuals aged 12+ at the time of the survey. I exclude cohorts younger than 12 years because these individuals were either not yet enrolled in school or were still in primary school at the time of the survey.

Figures B2a and B2b display the disparities in access to formal education and years of schooling across the Ghana-Togo border for different birth cohorts. Access to formal education is a binary variable, taking the value of one if a respondent has completed any formal education and zero otherwise. Years of schooling is measured as the total number of years completed. In both cases, I control for type of place of residence (rural or urban)

and gender. I also include ethnicity fixed effects so that I compare two individuals of same ethnicity and birth cohort living on opposite sides of the border.

I estimate the disparities across five birth cohorts, including pre-1963, 1963–1972, 1973–1982, 1983–1992, and 1993–2002. I group all cohorts born before 1963 into a single category due to sample size limitations. It is important to note that these estimates are based on an Intent-to-Treat (ITT) analysis, meaning that individuals are analyzed according to their birth cohort, regardless of whether they actually attended school with their own birth cohorts. I also report estimates only from my preferred window of 50 km radius around the border.

The results reveal a clear pattern of the differential impact of democratization on human development. Cohorts on the Ghana side born after democratization show differentially higher education levels. The effect is more pronounced in years of schooling, suggesting that children stay in school longer after democratization. This echoes the work of Harding and Stasavage (2014) and Stasavage (2005) who respectively find that African democracies are more likely to abolish school fees and spend more on education.

To be specific, the results suggest that individuals from the post-democratization cohort (1993–2002) on the Ghana side of the border are about 7 pp more likely to have acquired some level of formal education compared to those on the Togo side. Additionally, they have more than one extra year of schooling on average. In contrast, the estimates for earlier birth cohorts show smaller and statistically insignificant differences. This pattern suggests that the observed disparities in human capital are not a legacy of pre-existing differences but rather a result of Ghana's democratic reforms implemented after the 1992 transition.

BII Falsification

To reinforce the causal interpretation of my findings, I conduct a falsification exercise using a pseudo border that once divided British-controlled Gold Coast and German Togoland, as depicted in figure B3b. This border existed from 1884 to 1914, before Germany lost its colonial possessions following World War I. After the war, the German Togoland territory was divided between Great Britain and France, resulting in 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.

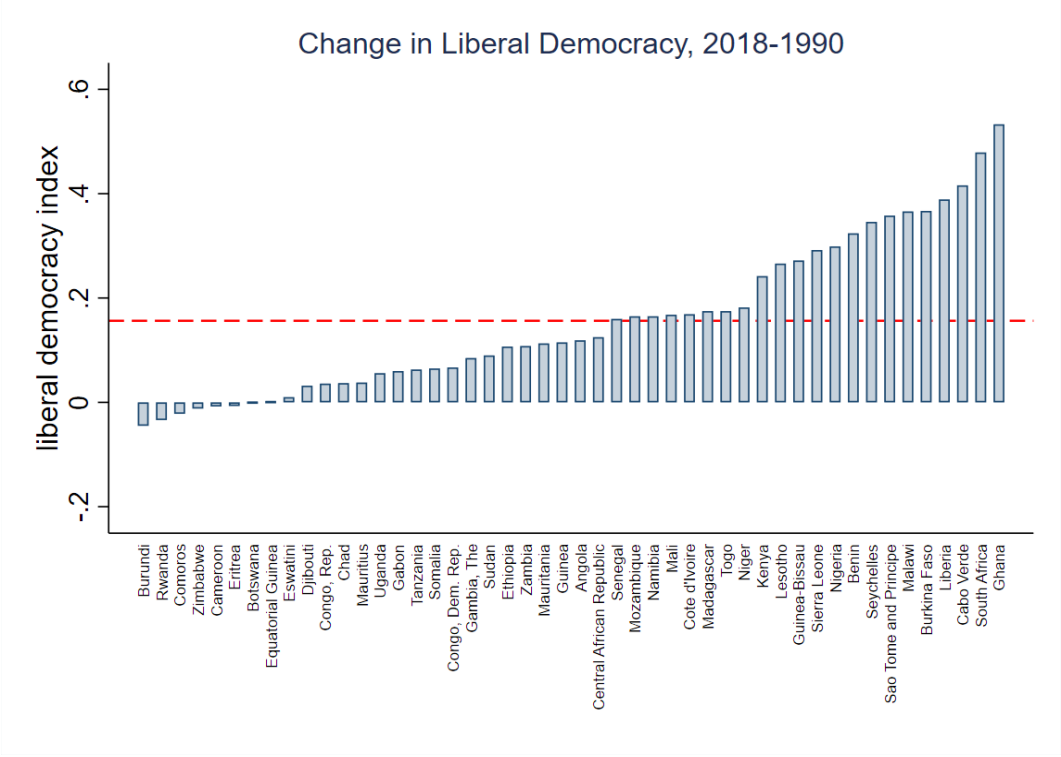
My main argument has been that the development disparities across the democratic-nondemocratic ethnic partitions are driven by one side consolidating its 1990s democratic takeoff. This implies that if this historical border no longer exists and both sides of the border have been governed by Ghana's democratic institutions since the early 1990s, there should be no systematic development disparities across this border today. If significant discontinuities are

observed, however, they would suggest that factors other than political regime differences are driving my main results.

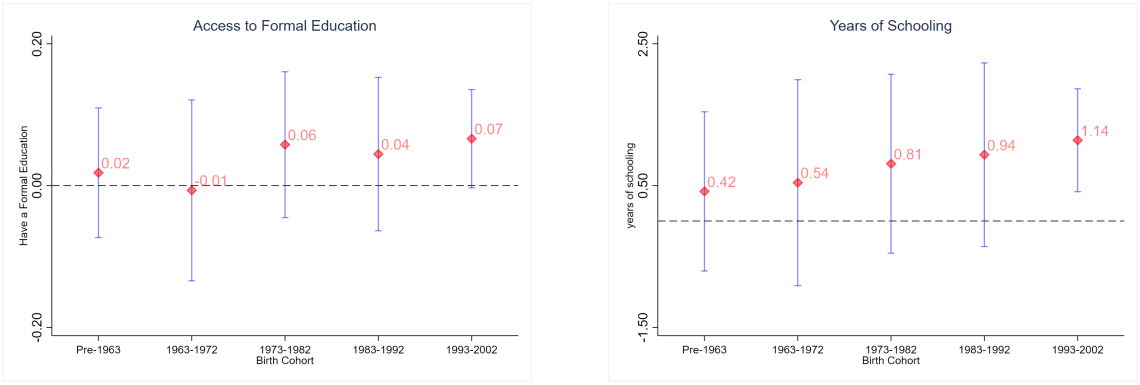
I limit this analysis to ethnic groups that would have been partitioned by the Gold Coast-British Togoland border. Ten ethnic groups straddle this border, five of which – Dagomba, Ewe, Gurensi, Krachi, and Mamprusi – qualify as major partitions. Remember a major partition means at least 5 % of an ethnic group's homeland falls in either side of the border.

The falsification results are presented in figure B4. The treated side is the former Gold Coast, and the control is the former British Togoland. The estimates suggest that there are no systematic differences in development outcomes across this historical border. Most coefficient estimates are small and statistically insignificant, even in the most recent years.

In effect, the absence of development disparities along the Gold Coast-British Togoland border reinforces my argument that the consolidation of the 1990s democratization wave has played a crucial role in shaping development outcomes in Africa. The sum of results in this study suggests that democratization, rather than pre-existing factors, has been the primary driver of the development divergence documented across democratic-nondemocratic ethnic partitions.



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



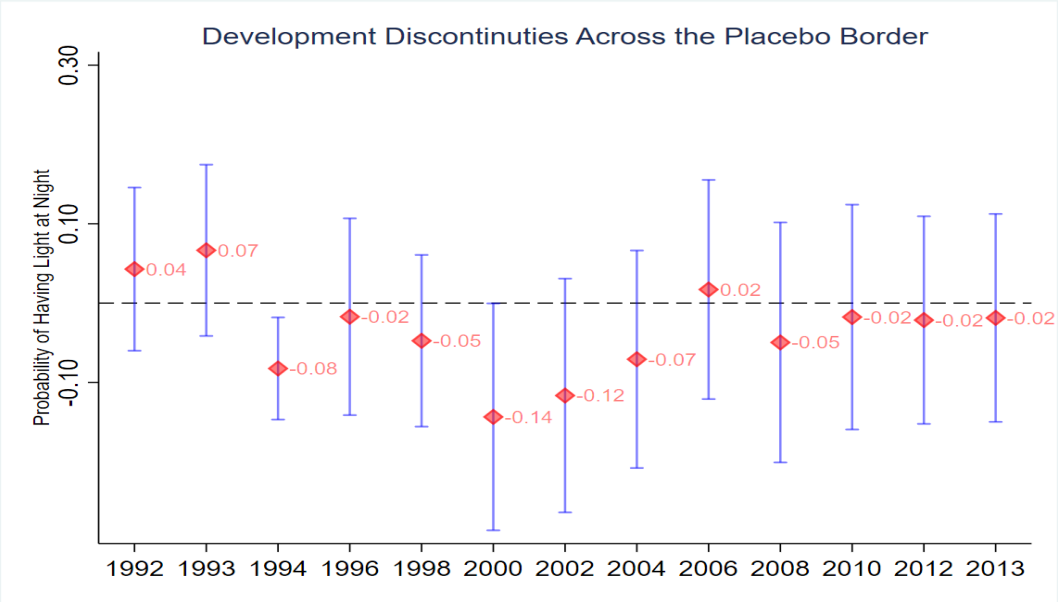
(a) (b)

Appendix Figure B2: The figures display the disparities in human capital across the Ghana-Togo border (50 km radius). The dependent variable in the left panel is access to formal education which takes a value one if the respondent has some form of formal education and zero otherwise. In the right panel the dependent variable is years of schooling (in single years). All specifications include ethnicity fixed effects and controls for type of place of residence (rural/urban) and gender. Standard errors are clustered at the survey sampling unit.

(a) The Gold Coast & Germany Togoland

(b) The Gold Coast, British Togoland & French Togoland

Appendix Figure B3: The left figure shows the Gold Coast and Germany Togoland respectively controlled by Great Britain and Germany until 1914. The right figure depicts the partitioning of Germany Togoland into British Togoland and French Togoland after World War I.



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