The Economic Foundations of Powersharing: Evidence from Africa

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Abstract.

How—and with whom—do rulers share power in weak states? Existing research focuses on the strategic logic of powersharing. In this paper we analyze its economic foundations. Powersharing is modeled as a subnational fiscal contract, in which rulers allocate political representation based on different constituencies' revenue potential. Empirically, we combine historical geospatial data on different types of primary commodity production — mineral point resources and diffuse smallholder cash crop agriculture — with the ethnic affiliation of cabinet ministers across 15 countries in Africa. Consistent with a revenue bargaining framework, cash crop groups are overrepresented in post-independence cabinets, while mining or food crop production do not translate into higher shares of power. However, cash crop producers' access to power is not fixed or deterministic. We show how these bargains are constrained by the strategic environment that structures authoritarian powersharing and exogenous changes in global commodity prices.

Introduction

Unequal access to state power along ethnic lines is found to be one of the key drivers of political instability, civil war, and underdevelopment.[1] As the consequences of ethno-political exclusion become increasingly clear, scholars have turned to better understanding the sources of powersharing and ruling coalition formation. Prevailing scholarship largely focuses on the political imperative of powersharing and its strategic dynamics (Gandhi and Przeworski 2006; Magaloni 2008; Arriola 2009; Roessler 2011; Svolik 2012; Boix and Svolik 2013; Francois, Rainer, and Trebbi 2015; Roessler 2016; Bormann 2019; Paine 2019; Meng 2020; Paine 2021; Meng and Paine 2021)—in which rulers seek to balance the need to co-opt rivals to prevent societal rebellion with the risks that come from granting them access to state power (Roessler 2016). Much less attention, however, has been paid to the economic bases of powersharing[2]—in which rulers share power as a means to underwrite alliances with groups who credibly contribute revenue to improve the government's fiscal position and enlarge the pie. We address this important line of inquiry with a focus on countries in Sub-Saharan Africa, in which ethnic powersharing has proven especially consequential.

In conceiving of powersharing as representing a subnational fiscal contract, we draw from an influential scholarship on the political economy of natural resources and revenue mobilization (Bates 1981; Levi 1989; Sokoloff and Engerman 2000; Auty 2001; Ross 2004b; Moore 2007; Ross 2015). One core precept from this body of literature is that fiscal regimes vary significantly depending on the resource type, its mode of production, and the organizational costs to the state to "earn" the income (Moore 2007). Classic models distinguish between mobile and fixed resources (Bates and Donald Lien 1985), as well between diffuse and point endowments (Auty 2001). Economies organized around mobile, diffuse resources are theorized to increase the state's taxation costs and society's bargaining power, resulting in more representative

[1] See for example Horowitz (1985), Cederman, Wimmer, and Min (2010).

[2] However, see Christensen and Gibilisco (2022) on the link between budgetary resources and powersharing.

forms of government. We apply this insight to revenue bargaining at the subnational level. We show how historical development of diffuse and point resources within and across countries in Africa gave rise to different subnational institutional legacies that varied local actors' bargaining power and rulers' need to strike an alliance with these intermediaries to increase revenue mobilization.

Our starting point is the primary commodity revolution that transformed African economies in the 19th and 20th centuries with the take off of the commercialization of agriculture and large-scale mining to supply export markets. This economic transformation, which preceded European colonization, and, in many ways, was a key impetus for imperial conquest, profoundly reorganized African economies (Hance 1964; Roessler et al. 2022)—but around different types of natural resources and modes of production. The spread of cash crop agriculture, especially cocoa, coffee, groundnuts, oil palm, and cotton was predominantly a smallholder phenomenon with plantations struggling to match the efficiency of extensive cultivation by family farms (Austin 1996). Outside of settler colonies, where European farmers had to wield state protections and economic repression to outcompete indigenous farmers, cash crop production was dispersed among smallholder farmers in suitable areas. This increased the incomes of a broad subset of farmers, enhancing their mobilizational potential. Collective action was further aided by the emergence of a cash crop elite, who benefited from the concentration of public services in their homeland, as well as the activation of ethnic ties and solidarity induced by growing competition over land (Pengl, Roessler, and Rueda 2022). In contrast, mining, which comprised substantial shares of pre-1960s exports in Angola, Belgian Congo, Cameroon, Guinea, Liberia, Northern Rhodesia, and Sierra Leone, represented classic point resources that alienated local land ownership, required more capital-intensive modes of production, and was dominated by a few large enterprises often in the hands of a foreign elite.

Consistent with the revenue bargaining literature, these disparate modes of production had important implications for state-society relations and the costs of taxation. Cash crops elevated society's bargaining power and the costs of direct taxation, whereas mineral extraction had the opposite effect—strengthening state control and

the ease of instituting direct taxes. This led to different types of fiscal contracts. In mining enclaves, institutions of direct control and taxation supplanted the government's need to trade societal representation for taxation. In contrast, among cash crop producers, this bargain was essential, even as—or, perhaps, especially because—the state sought to transform cash crops from diffuse to point resources by backing export monopsonies that could more easily be taxed (Bates 1981; Woolcock, Pritchett, and Isham 2001). Given cash crop groups' political capabilities, the weakness of formal institutions, and the costs of indirect taxation, rulers shared power with cash crop elites to ensure continued production of agricultural commodities and moderate resistance in the face of heavy downward pressure on producer prices due to state control of export markets.

However, unlike national-level fiscal contracts, in which rulers agree to representative institutions as a credible commitment to use taxes to supply public goods (Levi 1989; North and Weingast 1989), these subnational bargains did not set in motion broader institutional change. Instead, they played out in highly authoritarian, personalist systems. Two additional implications follow. Economic bargaining does not operate outside the broader strategic environment that structures authoritarian powersharing—and we would expect rulers to exercise caution in *how much* power they accord to economically-powerful elites. Moreover, cash crop groups' share of power is not fixed but likely to rise and fall as their revenue contributions change.

To test these hypotheses, we combine spatial data on historical primary commodity production in cash crop agriculture and minerals with pre-existing ethnic group-level information on political representation (Francois, Rainer, and Trebbi 2015; Vogt et al. 2015). We show that ethnic groups with colonial cash crop production were, on average, represented seven years longer in post-colonial cabinets. Instrumental variable models suggest that this effect is causal, and in line with our revenue bargaining framework, these effects are driven by smallholder cash crop producers—we find no effect from plantation agriculture. But, consistent with a strategic model of powersharing, cash crop groups tend not to be represented in the most powerful ministries except when their co-ethnic is president. This suggests incumbents seek

to strike a balance in bargaining with elites from economically-powerful cash crop groups—by offering them cabinet positions in exchange for their economic contributions, but to less important ministries.

We complement these cross-sectional results with an analysis of how exogenous changes in global prices affect ethnic groups' political power over time. We find that rising prices increase cash cropping groups' cabinet shares. No such effects are found for mineral resources or non-export crops. We further show that our results are unlikely to be driven by unequally distributed colonial investments in education (Ricart-Huguet 2021) or British legacies of indirect rule (Crowder 1964; Wucherpfennig, Hunziker, and Cederman 2016). Finally, we demonstrate that the subnational fiscal bargains entered into by cash crop elites did not come at the expense of their constituents' welfare—as is sometimes assumed given the extractive nature of export agriculture systems (Bates 1981).

Our paper advances scholarship in comparative politics and comparative political economy in several important ways. Existing research on powersharing tends to conceive of it as bargaining away a group's capabilities to credibly challenge the regime through armed rebellion (Gandhi and Przeworski 2006; Magaloni 2008; Boix and Svolik 2013; Francois, Rainer, and Trebbi 2015; Roessler and Ohls 2018).[3] Beyond this strategic rationale, our analysis demonstrates the economic logic of powersharing, in which rulers offer political representation to those groups who strengthen the regime's fiscal position.[4] Prevailing research on the fiscal contract tends to focus at the country-level (Ross 2004a; Timmons 2010) or on formal federal structures.[5] In contrast, we trace the effects of historical resource production on different subnational fiscal arrangements and patterns of representation. In demonstrating the institutional legacies of cash crop agriculture in Africa, we build on the pioneering work of Kasara (2007, 171), who suggests cash crop taxation rates are a function of "the ability of rulers to control ethnic intermediaries," as well as Boone (2003) and

[3] See also Paine 2021 who qualifies this "conventional threat logic."

[4] Christensen and Gibilisco (2022) model the effect of overall government revenue on inclusion or exclusion, but do not account for the revenue contributions of coalition partners.

[5] There is a very large literature on fiscal federalism. See for example Rodden (2004).

Arriola (2013b) who underscore the importance of cash crop agriculture on state-society relations in post-independence Africa. Finally, we find that the path dependent effects of colonial legacies are not immune to post-colonial shocks. In line with Ricart-Huguet (2021), we find the impact of colonial resource legacies varies over time depending on post-colonial economic change.

The 19th Century Commercial Transition in Africa, Modes of Production, and Institutional Legacies

The commercial transition from slave trading to "legitimate commerce" in natural resources marked a watershed in African history. With the end of the slave trade, demand for agricultural products in Africa took off, beginning in West Africa before spreading across the continent (Hogendorn 1969; Hopkins 1973). Likewise, the discovery of vast amounts of diamonds and gold in South Africa spurred a mineral revolution that spread northward into southern Africa. Over the next 150 years, the reorientation of production systems around mining and agricultural commodities would reshape Africa's economic geography (Roessler et al. 2022; Hance 1964). In this section, we offer a brief overview of this economic transformation highlighting the modes of production and institutional legacies arising from different primary commodities—which we will subsequently argue affected post-independence powersharing. We distinguish between two different modes of production that would characterize export commodities: smallholder farms versus mining and plantations.

One of the defining features of Africa's transition to commercial agriculture was the role played by smallholder farmers. With rising demand in industrializing Europe for vegetable oils (as a lubricant for machinery and railways and in production of soap, candles, and margarine), cotton, and later for coffee and cocoa, farmers began to convert land to cultivate these crops for export. A number of factors favored smallholder production. Oil palm, groundnuts and cotton were native to West Africa

with existing domestic markets.[6] Likewise, Ethiopia was the birthplace of Arabica coffee. Whereas cocoa was indigenous to South America, West Africa's tropical forest belt provided favorable ecological conditions, and existing technologies and farming practices for native crops, such as the kola nut, could be adapted to cocoa cultivation (Hogendorn 1969, 309). Moreover, the suitability and productivity of virgin forests enabled extensive cultivation practices, which advantaged small farms over plantations (Austin 1996; Hopkins 1973).

The commercialization of agriculture, dispersed across tens of millions of family farms,[7] led to an increasing monetization of land, labor, and output markets and yielded substantial profits for many African smallholders. While stimulated by external changes (such as, the abolition of the slave trades, technological change favoring long-distance trade in bulky commodities, and investments in transportation infrastructure reducing transportation costs), the the cash crop miracle was coproduced by a coalition of African entrepreneurs, traders, and smallholder farmers.

Formal colonization would intensify the cash crop revolution, which the imperial powers viewed as critical to making their colonial acquisitions profitable. The diffuse nature of smallholder production, however, presented the colonial authorities with multiple institutional challenges. Given their light administrative footprint, colonial governments relied heavily on local intermediaries to penetrate cash crop zones. Traditional chiefs not only served to champion, and compel, the uptake of commercial agriculture (Hogendorn 1969), but also played a critical role in regulating access to land, labor, and capital (Boone 2003; Berry 1993). Although chiefs wielded poll taxes to force local farmers to cultivate cash crops, they did not administer levies directly to export crops, which were conveniently taxed at the gate, i.e. the coastal ports from which they were shipped to Europe. These export channels were dominated by metropolitan trading houses, who could leverage monopsonistic control to

[6] Whereas the Bambara groundnut (*Vigna subterranea*) originated in West Africa, the peanut (*Arachis hypogaea*), with similar agricultural and culinary qualities, replaced it in popularity after spreading to the region during the Columbian Exchange.

[7] In Northern Nigeria alone groundnuts were cultivated by up to one million peasant farmers, who devoted only one to two acres to the crop.

absorb export tariffs and pass on the costs to producers (Mkandawire 2010). Before and during World War II, many colonies set up marketing boards which played a similar role.

Mining and plantations—the other key pillars of many colonial economies—differed markedly in terms of land, labor, and capital requirements, leading to divergent institutional legacies (Amin 1972; Mkandawire 2010). The large-scale mining of gold, copper, and diamonds took place on clearly-defined tracts of land and was based on large upfront capital investments. The open pit and deep shaft methods that were used to tap into the huge deposits at Kimberley, the Rand, Katanga, and the Copperbelt are prime examples. While Africans had practiced deep-shaft mining before the commercial transition, European companies such as De Beers, the Belgian Union Minière du Haut-Katanga, or the Portuguese Diamang spurred an unparalleled boom in capital-intensive mining methods (Herbert 1984). Imperialists consolidated direct control of key commercial entrepôts and mining sites, which were highly valuable, geographically-concentrated and thus comparatively easy to seize, administer, and directly tax.[8]

This was also the case for the European-run plantations and agricultural concessions that mostly emerged after formal colonialism, and which benefited from colonial investment, government favoritism to acquire land and labor below market rates, and brutal regimes of labor coercion. Examples include: coffee, tea, and tobacco plantations in Kenya and Southern Rhodesia, where cash crop production was long an exclusive White settler privilege; the coercive cash crop regimes producing coffee in Angola and sugar in Mozambique; and the company-run cotton schemes in today's Chad and Central African Republic (Isaacman and Roberts 1995).

In sum, economic institutional development in colonial Africa maps on well to Auty's (2001) distinction between the effects of point resources and diffuse resources. Point resources, such as minerals, tend to be concentrated and require capital-intensive modes of production, with labor often supplied by nearby reserves. This facilitates

[8] As Gardner (2012) documents, mining companies and European plantation owners were some of the few entities assessing income tax.

direct state control; favors the rise of monopolies and oligopolies; and supplants the power of local intermediaries. In contrast, diffuse resources, such as non-plantation agriculture, are produced among a number of small producers, raising the costs of state control and direct taxation, and increasing dependence on local intermediaries, elevating their political capabilities. But this local economic and political power was checked by the development of trading monopsonies who dominated the gate—through which nearly all cash crops had to pass as they were produced for export. Accordingly, as Woolcock, Pritchett, and Isham (2001) argue, through the operations of crop marketing boards "the potentially favourable socioeconomic linkages of diffuse smallholders are easily corrupted into point linkages." As we argue in the next section, and in line with Kasara (2007), such repressive policies do not negate the need for local intermediaries, but, if anything, increase their importance.

Economic Resources and Bargaining for State Power in Post-Colonial Africa

With the global economic and political changes wrought by World War II, colonial regimes across Africa faced growing pressure for self-rule. The reluctant Africanization of lower ranks of the colonial service and first representative bodies were just a prelude to the tidal wave of decolonization that swept the African continent in the late 1950s and early 1960s. With the sudden withdrawal of colonial governments, how would political power be distributed in newly independent states? In this section, we address this question, beginning with a brief discussion of the logic of powersharing before introducing our conceptual framework on the effects of different primary commodities.

Powersharing entails the distribution of key political, economic, and security positions of the state among elites embedded in different socio-political groups. With self-rule replacing the apartheid political systems imposed during colonialism, powersharing represented an opportunity for post-independence rulers to strengthen the

legitimacy of new governments and foster national unity (Rothchild and Foley 1988). It also was imperative, given the weakness of bureaucratic structures, to extend the reach of the regime and increase its authority over society, especially among groups with high political capabilities who, if not coopted, would represent a formidable threat (Francois, Rainer, and Trebbi 2015).

A number of studies find that group capabilities—due to higher levels of education (Ricart-Huguet 2021), financial resources (Arriola 2013a), and advantageous ethnic geography (i.e., group size and proximity to capital (Francois, Rainer, and Trebbi 2015; Roessler and Ohls 2018))—are a significant predictor of political representation. Beyond this political logic, we also expect incumbents to prioritize alliances with groups who could promise to contribute revenue and improve the government's fiscal position. The political economy of powersharing, however, has received much less attention.

In modeling the economic bases of powersharing, our starting point is rulers' revenue imperative; controlling economically high-value enclaves was important for state-building and regime survival. An influential literature on revenue mobilization highlights the state's bargaining power vis-à-vis society and the "transaction costs of implementing and enforcing policies" (Levi 1989). In post-independence Africa, these processes were profoundly shaped not only by the persistent effects of different modes of economic production—point versus diffuse resources—but also the different institutional legacies arising from colonial extraction.

As described in the previous section, cash crop enclaves were characterized by diffuse resources produced by smallholders with the colonial regime relying on a combination of institutions of indirect control through local intermediaries and indirect taxation through state-supported monopsonies. This left a countervailing legacy. While post-independence governments could readily adopt marketing boards to reduce the costs of taxing farmers, cash crop areas had a head start in terms of both elite formation and political capabilities vis-à-vis the state through a number of different channels. For one, cash crops created local opportunities for profit and accumulation that did not exist in mining or plantation enclaves. This contributed to the early rise

of an African commercial elite (Arriola 2013b). Moreover, indirect and communal forms of rule gave local chiefs and commercial patrons the leeway to assemble loyal and effective coalitions. Rising incomes enabled families and patrons to invest in the formal education of their children and clients (Berry 1993). Finally, cash crop agriculture combined with population growth (due in part to an influx of migrant farmers and laborers) increased land pressure, leading host communities to activate and strengthen ethnic identity as a means to control agricultural rents (Pengl, Roessler, and Rueda 2022).

Given cash crop groups' political and economic capabilities, incumbent rulers had to manage them one way or the other. Some, such as Kwame Nkrumah, sought to emasculate them by, at once, supplanting chiefs' local authority and leveraging the state marketing boards to undercut their economic wealth. Although Nkrumah checked the power of the Asante and other cash crop producers, this proved a Pyrrhic victory, as it contributed to economic and political discontent in the country, opening the door for the military coup in 1966.[9]. In most other cases, post-independence governments co-opted cash crop elites and used their local authority to mutual advantage. Continued export production was crucial to stabilize revenue flows. As land rights and production modes were rarely under direct government control, local intermediaries were needed to ensure efficient production and acquiescence to heavy taxation through tariffs and marketing boards (Bates 1981; Kasara 2007; Boone 2003). These economic and institutional features made incumbents more likely to pay heed to cash crop elites' political aspirations. When distributional conflicts between incumbents and cash crop elites occurred, the bargaining space for peaceful agreement was large.

The effects of cash crop agriculture on powersharing stand in stark contrast to mineral resources and food crops. In the case of minerals, institutional legacies of direct control of these point resources often came at the expense of local intermediaries, weakening their bargaining power and political capabilities—and as a result reducing

[9]One of the co-conspirators of the coup, Akwasi Afrifa, from the Asante, lamented Nkrumah's use of the Cocoa Purchasing Company "to allocate" his party "one million pounds after every seasonal sale of cocoa" and "the steady erosion" of cocoa farmers "real income" (Afrifa 1966, 87-88)

their share of political representation in the central government. Food crops resembled cash crops in terms of the mode of production and institutions of local control, but their low revenue value reduced the ruler's demand for intermediaries from these groups, while also constraining their political capabilities as these areas tended to be marginalized and poorer. Table 1 summarizes these different production characteristics and institutional linkages of cash crops, minerals, and food crops and the expected effects on post-independence powersharing.

Table 1: Theoretical Expectations of Effects of Different Resource Types on Powersharing in Post-independence Africa

	Revenue value	Mode of production	Colonial institutions	Group capabilities	Powersharing demand
Cash crops	High	Dispersed	Indirect rule	High	High
Minerals	High	Concentrated	Direct rule	Low-medium	Low
Food crops	Low	Dispersed	Indirect rule	Low	Low

In sum, we expect cash crop groups to have higher levels of political representation than groups residing in colonial mining enclaves or among groups that only grow food crops. There are two important auxiliary hypotheses to our general argument, however. First, a growing literature illuminates the strategic dynamics structuring powersharing (Roessler 2016; Svolik 2012; Bormann 2019; Paine 2021; Meng and Paine 2021). At its core, this literature highlights how information and especially commitment problems can lead to bargaining failure in the absence of formal institutions and under the threat of force. In the face of this uncertainty—namely whether rivals would exploit their access to the central government to try to usurp a larger share of power—rulers pursued strategies to hedge against coup risk, such as strategic allocation of cabinet positions or ethnic stacking of the military that risked provoking other types of instability and violence (Roessler 2016; Paine 2019; Horowitz 1985). Thus, even as rulers struck alliances with elites from cash crop zones, they may have been careful to limit these powerful economic actors' access to the highest echelon of the regime. Second, regime demand for revenue-providing powershar-

ing partners is neither static nor deterministic. As revenue falls, we would expect cash crop elites' share of power to wane. Accordingly, we expect cash crop prices to predict temporal variation in government composition.

Data

To test the effect of different types of primary commodities on powersharing, we combine ethnic group-level data on political representation with subnational data on colonial export production. For the latter, we draw on Roessler et al.'s (2022) digitization of the map produced by Hance, Kotschar, and Peterec (1961) providing source locations of more than 95 percent of exports in 1957 across 38 African states.

The main data source on political representation is the "ethnicity of ministers" database, which codes individual cabinet ministers' ethnic affiliation for 15 African countries (Francois, Rainer, and Trebbi 2015, henceforth FRT).[10] For each ethnic group-year contained in the cabinet data, one can assess whether a group is represented at all, and if yes, how many and which cabinet portfolios it controls. To aggregate historical primary commodity production to these groups' historical homelands, we first match all but five of the ethnic groups in FRT's sample to the ethnic polygons from the World Language Mapping System, the geospatial companion dataset of Ethnologue (WLMS 2017). We then sum the value of historical primary commodity production in each ethnic polygon, distinguishing between cash crops and mineral resources.

The Online Appendix to this paper provides summary statistics and descriptive plots of all relevant variables.

[10] Benin, Cameroon, Côte d'Ivoire, DRC, Gabon, Ghana, Guinea, Liberia, Nigeria, Republic of Congo, Sierra Leone, Tanzania, Togo, Kenya, and Uganda. The data covers the years 1960–2004.

Cross-Sectional Analysis

In the first set of analyses, we test whether group-level cash crop endowments translate into higher levels of political representation across the entire post-colonial period. For this general test, we employ a cross-sectional research design. For each ethnic group, we calculate the share of years between 1960 and 2004 with at least one minister. In addition, we calculate the mean of each group's minister share across all post-colonial cabinet years. These two variables serve as main dependent variables in the analyses below.

Research Design

The baseline specifications take the following form:

$$Y_{ic} = \alpha_c + \beta \, \text{Colonial Cash Crops}_{ic} + \gamma \, X_{ic} + \epsilon_{ic}$$

The unit of analysis is ethnic group i in African country c. Y_{ic} is one of our two political representation outcomes. The coefficient of interest in the model is β. It captures the effect of colonial cash crop endowments. We choose two operationalizations for the cash crop variable. The first is a dummy indicating if ethnic group i's settlement area saw any cash crop production. The second codes per capita values of cash crop production within each group polygon combining the Hance data with a 1960 population grid (Klein–Goldewijk, Beusen, and Janssen 2010).[11] α_c are country fixed effects that control for time-invariant differences between post-colonial states. X_{ic} contains ethnic group-level controls that may correlate with both cash crop production and political power. It includes a group's share in the national population, mean elevation and terrain slope, agricultural suitability, distances to coast and capital as well as precolonial political centralization and historical reliance on agriculture

[11] Table A5 in the Appendix shows that standardizing production values by area or not at all does not alter the results.

from Murdock's (1967) Ethnographic Atlas.[12] We estimate all models via OLS and use Conley (1999) standard errors with a distance cutoff of 400 km (ϵ_{ic}). The errors thus allow for spatial correlation within the radius of a circle that roughly corresponds to the mean country size in our sample.[13]

This baseline specification yields unbiased estimates if our colonial cash crop proxy is conditionally exogenous to political power. If already powerful ethnic groups were more likely to adopt cash crops or unobserved group-level variables affect both cash crop production and post-colonial representation, coefficients will be biased. While X_{ic} contains the most obvious geographic and historical confounds, unobserved differences in mobilization potential may affect our estimates. We address these threats to inference by instrumenting colonial cash crops with agro-climatic soil suitability scores from the FAO's GAEZ database (FAO/IIASA 2011). To yield valid causal estimates, the instrument has to be relevant and predict actual production with sufficient precision. The first stage F statistics of our IV models show that this condition is met. Second, the exclusion restriction requires that the instrument only affects the outcome through the endogenous treatment.

While the soil and climatic characteristics on which the suitability data is based are exogenous to political and economic activities, the exclusion restriction is threatened by two alternative causal pathways. First, fertile soils may have led to higher population density, complex forms of social organization, and thus greater mobilization potential. Second, cash crop suitability clusters in humid forest zones relatively close to coastal trading hubs. These alternative pathways can be measured and included in the set of control variables. All models control for *general* agricultural suitability (Ramankutty et al. 2002). We further control for logged distance to the closest seacoast and the respective national capital. The historic agriculture and

[12] Elevation and slope grids come from FAO/IIASA (2011) and are aggregated by using polygon means. Agricultural suitability data is from Ramankutty et al. (2002). Centroid distances to coast and capitals based on own calculations. The Ethnographic Atlas (EA) variables were matched to the digitized version of Murdock's (1959) "Tribal Map of Africa" by Nunn (2008). We match Murdock polygons to WLMS and GeoEPR polygons via the publicly available linking data provided by Müller-Crepon, Pengl, and Bormann (2022).

[13] Table A6 replicates our baseline models with country-clustered standard errors.

political centralization variables control for early agricultural intensification or political organization. Conditional on these covariates, the exclusion restriction seems defensible.

Results

Table 2: Cash Crops and Political Inclusion (1960-2004)

	Represented (Y/N)		Gov. Share (log)	
Colonial Cash Crops (Y/N)	0.156***		0.336***	
	(0.038)		(0.093)	
Cash Crop Value p.c. (log)		0.022***		0.049***
		(0.006)		(0.014)
Country FE	Yes	Yes	Yes	Yes
Baseline Controls	Yes	Yes	Yes	Yes
Observations	260	260	260	260

Notes: Linear models estimated via OLS. The sample means of the dependent variables are 0.56 (columns 1–2) and 0.057 (columns 3–4). Control variables include ethnic groups' population shares, mean elevation and terrain slope, soil and climatic suitability for agriculture, centroid distances to coast and capital city, precolonial reliance on agriculture and precolonial political centralization. Conley errors with distance cutoff of 400km in parentheses. Significance codes: *p<0.1; **p<0.05; ***p<0.01

Table 2 presents our baseline results. The first two columns use the share of years in cabinet as dependent variable. The colonial cash crop coefficient is positive and highly significant. On average and all else equal, groups with colonial cash crops were represented 7.02 years longer in post-colonial cabinets. The level-log specification in the second column yields an equally positive and significant coefficient estimate. Doubling the per capita value of colonial cash crop production (+100%) is associated with a representation gain of one additional year. Columns 3 and 4 use the logged government share of ethnic groups as outcome.[14] Both the binary and the continuous cash crop proxies have positive and significant coefficients. The substantive effect of the dummy variable indicates that cash crop groups had, on average, 39.93 percent more ministers. The fourth column suggests that a 100% increase in

[14] We add 1 to keep zero-valued observations in the sample.

Table 3: Minerals and Political Inclusion (1960-2004)

	Represented (Y/N)		Gov. Share (log)	
Colonial Mining (Y/N)	−0.031		−0.106	
	(0.060)		(0.155)	
Colonial Mineral Value p.c. (log)		0.000		0.001
		(0.009)		(0.026)
Country FE	Yes	Yes	Yes	Yes
Baseline Controls	Yes	Yes	Yes	Yes
Observations	260	260	260	260

Notes: Linear OLS models. The sample means of the dependent variables are 0.56 (columns 1–2) and 0.057 (columns 3–4). Control variables include ethnic groups' population shares, mean elevation and terrain slope, soil and climatic suitability for agriculture, centroid distances to coast and capital city, precolonial reliance on agriculture and precolonial political centralization. Conley errors with 400 km distance cutoff in parantheses. Significance codes: *p<0.1; **p<0.05; ***p<0.01

per capita production values translates into a 5% higher cabinet share. This first set of results is in line with our theoretical argument that cash-crop producing groups are overrepresented in post-colonial ruling coalitions.[15]

Table 3 repeats the analysis for colonial mineral production. The colonial mining terms remain small and far from significant. Table 4 replaces colonial cash crop or mineral production with estimated per capita values of food crop production. We use two datasets that contain grid-level information on the potential to grow or actual production of specific crops. The first is the FAO GAEZ database that, in addition to raw suitability scores, estimates potential crop yields per hectare. For each ethnic polygon, we weigh the mean yield of maize, sorghum, and wheat by their 1960 world market prices (Jacks 2013). For other important and mostly locally traded African staple crops such as cassava, millet, plantains, or yam, the standard sources do not contain world market prices. Fortunately, maize and sorghum are the two most important food crops in the 15 countries in our sample.[16] The second dataset is the M3 data by Monfreda, Ramankutty, and Foley (2008) providing harvested area,

[15] Figure A7 in the Appendix plots estimates from 45 yearly replications of Model 1 in 2.

[16] We calculated the total harvested area of each of the 175 crops contained in the M3 dataset (Monfreda, Ramankutty, and Foley 2008) within the spatial union of all 15 countries. Maize is planted on 115'000 km^2 of cropland, sorghum on 77'011 km^2 and wheat on 2'536 km^2.

Table 4: Food Crops and Political Inclusion (1960-2004)

	Represented (Y/N)		Gov. Share (log)	
Staple Crop Value p.c. (FAO, log)	−0.032**		−0.094**	
	(0.016)		(0.041)	
Staple Crop Value p.c. (M3, log)		−0.054**		−0.106**
		(0.022)		(0.048)
Country FE	Yes	Yes	Yes	Yes
Baseline Controls	Yes	Yes	Yes	Yes
Observations	259	259	259	259

Notes: Linear OLS models. The sample means of the dependent variables are 0.56 (columns 1–2) and 0.057 (columns 3–4). Control variables include ethnic groups' population shares, mean elevation and terrain slope, soil and climatic suitability for agriculture, centroid distances to coast and capital city, precolonial reliance on agriculture and precolonial political centralization. Conley errors with 400 km distance cutoff in parantheses. Significance codes: *p<0.1; **p<0.05; ***p<0.01

yield and production volumes of 175 crops around the year 2000. We use the maize, sorghum, and wheat production grids to calculate, for each ethnic homeland, an estimated production value for the year 2000. We than re-express this value in 1960 USD and divide by 1960 population. Production in 2000 may, of course, be endogenous to political events. However, actual production estimates are arguably closer to real output than the total agro-climatic potential from the GAEZ data. Table 4 shows that groups with high staple crop production or potential are significantly less likely to be politically included. The results from Table 2 seem clearly specific to cash crops and do not just reflect high agricultural productivity.

Table 5 presents findings from our instrumental variable models. The first-stage F statistics are well beyond the critical threshhold and indicate sufficient relevance of the suitability instrument despite controlling for general agricultural suitability. All second-stage coefficients are positive and significant at conventional levels. The estimated effects are 1.4-2 times larger than in Table 2 but the 95% confidence intervals always contain the naïve OLS estimate.[17]

As last part of our cross-sectional analysis, we test the auxiliary hypothesis that

[17] Table A7 replicates the 2SLS-IV analysis with country-clustered standard errors. Table A8 reports reduced form estimates.

Table 5: Instrumenting Cash Crops (1960-2004)

	Represented (Y/N)		Gov. Share (log)	
Cash Crops (Y/N), fitted	0.313**		0.537*	
	(0.128)		(0.292)	
Cash Crops p.c.× price (log), fitted		0.041**		0.071**
		(0.017)		(0.036)
Country FE	Yes	Yes	Yes	Yes
Baseline Controls	Yes	Yes	Yes	Yes
First-Stage F	17.51	19.18	17.51	19.18
Observations	260	260	260	260

Notes: Instrumental variable models estimated via 2SLS. The sample means of the dependent variables are 0.56 (columns 1–2) and 0.057 (columns 3–4). Control variables include ethnic groups' population shares, mean elevation and terrain slope, soil and climatic suitability for agriculture, centroid distances to coast and capital city, precolonial reliance on agriculture and precolonial political centralization. Conley errors with 400 km distance cutoff in parentheses. Significance codes: *p<0.1; **p<0.05; ***p<0.01

strategic African rulers are hesitant to appoint non-coethnic elites to the most important cabinet posts, despite pertinent economic incentives. To that end, we replicate our baseline model from Column 1 in Table 2 but now distinguish between strategically important 'top' and more lower-level ministerial portfolios as coded by Francois, Rainer, and Trebbi (2015). More specifically, we define four dependent variables calculating, for each ethnic group, the share of years it had: (i) at least one low-level position, (ii) at least one top position, (iii) low positions while not controlling the presidency, (iv) top positions while not controlling the presidency. If leaders prevent internal challenges by reserving top positions to ethnic peers, we would expect no or only small effects of cash crops on high-level representation of non-leading ethnic groups.

This is exactly what our results in Table 6 suggest. Columns 1 and 2 show that our baseline findings reflect representation in both high- and lower-level positions. The significant coefficient in Column 3 indicates that cash-cropping groups continue to be overrepresented in lower-level positions even under non-coethnic presidents. The small and insignificant coefficient in Column 4 suggests that this finding does not extend to top positions, confirming the intuition that African leaders carefully

weigh economic incentives and internal threats when appointing coaliton partners.

Table 6: Economic and/or Strategic Powersharing?

	Low	Top	Low, no lead	Top, no lead
Colonial Cash Crops (Y/N)	0.133***	0.074**	0.112***	0.050
	(0.030)	(0.029)	(0.035)	(0.034)
Country FE	Yes	Yes	Yes	Yes
Baseline Controls	Yes	Yes	Yes	Yes
Observations	260	260	260	260

Notes: Linear OLS models. The sample means of the dependent variables are 0.469 (Column 1) and 0.307 (Column 2), 0.066 (Column 3), 0.414 (Column 4), and 0.242 (Column 5). Control variables include ethnic groups' population shares, mean elevation and terrain slope, soil and climatic suitability for agriculture, centroid distances to coast and capital city, precolonial reliance on agriculture and precolonial political centralization. Conley errors with 400 km distance cutoff in parantheses. Significance codes: *p<0.1; **p<0.05; ***p<0.01

Alternative Explanations & Robustness

In the Online Appendix to this paper, we investigate alternative explanations of our findings and conduct additional robustness checks. In Table A9, we distinguish African-produced smallholder crops from plantation and settler agriculture. Consistent with our theoretical arguments, only smallholder production predicts representation in ministerial cabinets.

In a valuable contribution on the historical determinants of African ruling coalitions, Ricart-Huguet (2021) highlights the importance of colonial education investments. Table A10 adds the number of Christian missions and ethnic group-level education rates around independence to our group-level specifications. The results show that educational advantages of cash crop groups are unlikely to explain our findings.

As cash crops tended to be adopted earlier in British colonies and British indirect rule may have relied more extensively on local intermediaries, we run interaction models with an indicator for former British colonies. The interaction terms in Table A11 are positive but insignificant indicating that our findings also hold for non-British colonies.

As a further robustness check, we replicate the analysis with EPR data on political inclusion, which covers more countries but provides much cruder and merely categorical information on political representation (Vogt et al. 2015). While coefficients on the colonial cash crop dummy remain insignificant, logged per capita production remains positive and significant (Table A12).

The Dynamic Effects of Cash Crop Agriculture on Powersharing

The cross-sectional results support the claim that post-independence rulers were likely to overrepresent cash crop-producing groups in their cabinets. Here we test the auxiliary hypotheses on the dynamic effects of cash crop agriculture on powersharing, i.e. if temporal changes in the market value of colonial cash crops affect incumbents' willingness to share power with ethnic elites from producing regions.

We estimate the following time-series cross-sectional model:

$$Y_{ict} = \alpha_{ic} + \delta_{ct} + \beta \, \text{Cash Crops Weights}_{ic} \times \text{Price}_{t} + \epsilon_{ict}$$

Y_{ict} is either a dummy coded one for all group-years with at least one minister or a group's logged minister count. The model includes both ethnic group (α_{ic}) and country-year (δ_{ct}) fixed effects. Group fixed effects net out all time-invariant group-level factors. Country-year fixed effects control for all temporal shocks and trends at the country level. Changes in, for example, regime type, cabinet size, and national economic policy are contained in δ_{ct}. This is the reason why we operationalize the continuous representation outcome as raw minister count instead of government share as in the cross-sectional models above. In short, we approximate a difference-in-differences setup where temporal changes in an ethnic group's political status are explained by temporal changes in the market value of that group's natural resources.

The main predictor variable is an ethnic group-level cash crop price index . World market prices come from Jacks (2013). We restrict the analysis to the five most im-

Table 7: Cash Crop Prices & Political Inclusion (1960-2004)

	Represented (Y/N)		Minister Count (log)	
Cash Crop Weights × Price (log)	0.094**	0.087**	0.624**	0.594**
	(0.038)	(0.041)	(0.274)	(0.300)
Group FE	Yes	Yes	Yes	Yes
Country-Year FE	Yes	Yes	Yes	Yes
Controls × Year Dummies	No	Yes	No	Yes
Observations	10,706	10,664	10,706	10,664

Notes: Linear OLS models. The sample means of the dependent variables are 0.56 (columns 1–2) and 1.47 (columns 3–4). Control variables in columns 2 and 4 are the same as in the crosss-sectional models above. Two-way clustered standard errors in parentheses: Ethnic group and country-year clusters. Significance codes: *p<0.1; **p<0.05; ***p<0.01

portant colonial cash crops that are unambiguously coded on the historical map by Hance, Kotschar, and Peterec (1961). For each ethnic group, we calculate the index as an annual weighted mean of the five cash crop prices. In the baseline specifications, we use individual crop shares in the respective group's total colonial export value as weights. In other words, we weight cash crop prices by the economic importance for a particular group. This operationalization translates Bazzi and Blattman's (2014) country-level approach to the group level.[18] To check whether any results are specific to cash crops, we run similar models that use global mineral and food crop prices as an exogenous source of temporal variation in ethnic groups' resource potential.

Results

Table 7 presents our cash crop results. The first two columns use the binary representation dummy as outcome, whereas Columns 3 and 4 rely on logged minister counts. Columns 1 and 3 include no other predictor variables than the group-specific cash crop price series. Columns 2 and 4 add interactions between all baseline controls from above and 44 year dummies. All four coefficients are positive and significant at the 5% level. Substantively speaking, a doubling of cash crop prices is associated

[18] In Appendix Table A13, we replicate the analysis with weights based on per capita and total cash crop values.

Table 8: Mineral Prices & Political Inclusion (1960-2004)

	Represented (Y/N)		Minister Count (log)	
Mineral Weights × Price	−0.004		−0.021	
	(0.065)		(0.491)	
Number of Active Mines		−0.015		−0.125
		(0.025)		(0.193)
Group FE	Yes	Yes	Yes	Yes
Country-Year FE	Yes	Yes	Yes	Yes
Controls × Year Dummies	No	No	No	No
Observations	10,966	10,966	10,967	10,967

Notes: Linear OLS models. The sample means of the dependent variables are 0.56 (columns 1–2) and 1.47 (columns 3–4). Control variables in columns 2 and 4 are the same as in the crosss-sectional models above. Two-way clustered standard errors in parentheses: Ethnic group and country-year clusters. Significance codes: *p<0.1; **p<0.05; ***p<0.01

with a roughly nine percentage points higher probability of political representation. This amounts to a 17% increase relative to the sample mean. Columns 3 and 4 suggest that a 100% increase in the world market value of an ethnic group's cash crops implies 60% more ministers. Put differently, a group with previously two cabinet members is expected to get at least one additional minister. Price changes in the order of magnitude of 100% are far from uncommon. Cocoa prices almost halved between 1960 and 1965, doubled until 1969, halved again in 1971, and increased more than fivefold until 1977. They then went into a long decline that reached its bottom in 2000 at less than one tenth of 1977 values. Between 2000 and 2010, cocoa prices almost tripled.

The results in Table 7 have a plausibly causal interpretation if global cash crop prices are exogenous to economic and political developments within the countries in our sample. This assumption is threatened where individual countries or groups contribute significant shares to global cash crop production and are thus able to influence world markets. The only two countries in our sample that have, at times, produced more than 5% of global crop-specific output are Ghana and Côte d'Ivoire (both cocoa). In Appendix Table A14 we drop these countries from the sample and get similar results.

Table 8 summarizes results based on colonial and more recent mining data. The

Table 9: Adding Staple Crop Prices (1960-2004)

	Represented (Y/N)		Minister Count (log)	
Cash Crops × Price		0.098***		0.638**
		(0.038)		(0.271)
Minerals × Price		0.009		0.072
		(0.066)		(0.495)
Staple Crops × Price	0.040	−0.003	−0.436	−0.713
	(0.365)	(0.360)	(2.584)	(2.551)
Group FE	Yes	Yes	Yes	Yes
Country-Year FE	Yes	Yes	Yes	Yes
Controls × Year Dummies	Yes	Yes	Yes	Yes
Observations	10,924	10,924	10,924	10,924

Notes: Linear OLS models. The sample means of the dependent variables are 0.56 (columns 1–2) and 1.47 (columns 3–4). Control variables in columns 2 and 4 are the same as in the crosss-sectional models above. Two-way clustered standard errors in parentheses: Ethnic group and country-year clusters. Significance codes: *p<0.1; **p<0.05; ***p<0.01

predictor variable in the first row is the mineral equivalent to the cash crop variable from Table 7. As Jacks (2013) does not provide price series for all minerals on the Hance map, we add price data from Bazzi and Blattman (2014). The prices are weighted in the same way as described for cash crops above. The coefficients in columns 1 and 3 are very close to zero and far from statistically significant. Just as in the cross-sectional analysis, the value of colonial mining resources does not affect ethnic representation. However, global demand for minerals changes over time and Africa has seen a couple of veritable post-independence mining booms. New deposits were discovered and mines opened up in different locations than in the colonial age. To rule out the possibility that more contemporary mining leads to political representation, we use the industrial MinEX Consulting database that codes time-varying information on known mineral deposits as well as mine opening and closing years (MinEx 2018). We calculate the number of active mines for each ethnic polygon-year and rerun the models. Coefficients in Columns 2 and 4 remain negative, small, and insignificant. Neither colonial nor more contemporary mining activities are associated with group-level representation in ministerial cabinets.

Last but not least, we analyze the effects of price changes for the staple crops maize, sorghum, and wheat. We use the mean potential yields of these crops in each ethnic group polygon to construct a group-specific food crop price index. Geospatial data on potential yields is taken from FAO/IIASA (2011). Columns 1 and 3 of Table 9 show no significant effects of ethnic groups' food cropping potential on political representation. The coefficients are small and their sign varies with the operationalization of the dependent variable. Columns 2 and 4 estimate models that include group-level price indices of colonial cash crops, minerals, and food crop potential alongside each other. The results remain very similar to the separate specifications above.

A Subnational Fiscal Contract?

The essence of the fiscal contract is that citizens exchange taxation for a share of governance—i.e. representation and public services. We have shown how that, in the absence of direct institutions of control over cash crop agriculture, post-independence rulers exchanged representation for sustaining indirect systems of revenue generation. Did this contract also entail better access to services? Previous research provides grounds for skepticism. Bates (1981) and Kasara (2007) argue that African governments tend to distribute surplus away from rural cash crop producers due to the latter's weak bargaining power—given their higher collective action costs and dependence on fixed assets. Thus, incumbent presidents may well co-opt cash crop elites as useful coalition partners. However, the bulk of the cash cropping population is not necessarily expected to benefit given their higher tax burden (Kasara 2007). Does the representation of cash crop elites merely serve as a tool to exploit their rural constituencies? Or does something resembling a subnational fiscal contract emerge—in which *local* public goods are supplied in return for heavy taxation?

We test this using DHS data on infant mortality rates as a proxy for the well-being of rural constituencies (USAID 2012). Infant mortality rates likely react to changes in both household income and local public goods such as health clinics and medical staff. The DHS surveys contain the complete birth histories of all female respondents

with at least one child. This allows to construct a pseudo-panel with information on individual infants' birth years and their survival or death. Geocoded survey rounds with information on infant mortality are available for all but one country of the FRT sample (Congo-Brazzaville). We use the geographic coordinates of DHS survey clusters to assign infants to ethnic group polygons. We construct a mortality dummy that is coded 100 for all infants who have died in the first twelve months after their birth. The resulting dataset contains 879,922 infants, 617,151 of them born in rural survey locations.

We use the rural subset to estimate simple linear probability models of infant mortality. The unit of observation is the individual infant nested in an ethnic group polygon. The group-specific cash crop price index serves as main independent variable testing whether rising prices translate into higher chances that rural infants in producing regions survive. If all surplus is distributed away from cash crop regions, we would not expect an effect. All models contain ethnic group fixed effects and country-survey-cohort dummies. Group fixed effects ensure that we only exploit temporal variation in ethnic group's mean infant mortality rates. The country-survey-cohort dummies restrict comparisons to infants who were born in the same year and country and whose mother was interviewed in the same DHS survey round. In a second step, we interact cash crop prices with political representation variables from the FRT data. If the higher tax burdens documented by Kasara (2007) are not matched with local public goods, we would expect negative and significant interaction terms. The number of interviewed mothers and their reported infants varies drastically across groups. We therefore weight all observations by the inverted sum of infants per ethnic group in line with our interest in group-level rather than individual effects.

Table 10 reports results for the rural subsample. The constitutive term of group-specific cash crop values is always negative and significant. A doubling in cash crop prices reduces infant mortality rates in rural producing areas by one percentage point (10% of the mean mortality rate in our sample). While rural constituencies may be heavily taxed, they clearly benefit from rising values of their resources. Some surplus

Table 10: Cash Crop Values, Political Representation & Rural Infant Mortality

	Infant Mortality		
	(1)	(2)	(3)
Cash Crops × Price (log)	−0.994**	−1.013**	−0.995**
	(0.395)	(0.399)	(0.399)
Represented (Y/N)		0.157	
		(0.631)	
Minister Count (log)			0.212
			(0.596)
Cash Crop Value × Represented (Y/N)		0.031	
		(0.121)	
Cash Crop Value × Minister Count			−0.002
			(0.100)
Ethnic Group FE	Yes	Yes	Yes
Country-Survey-Round-Cohort FE	Yes	Yes	Yes
Individual Controls	Yes	Yes	Yes
Observations	617,151	617,151	617,151

Notes: Linear probability models estimated via OLS. The sample mean of the dependent variable is 10.76 infant deaths per 100 live births. Observations are weighted to ensure equal weights for each ethnic group. Control variables include mothers' education, age and age squared, as well as newborns' sex, a twin dummy, birth rank, and birth rank squared. Standard errors clustered by ethnic group in parentheses. Significance codes: *p<0.1; **p<0.05; ***p<0.01

remains at the site of production. The interactions with the binary and continuous representation variables yield small and insignificant coefficients. The representation of ethnic elites from producing regions in ministerial cabinets does not alter the effects of rising prices on rural constituencies' infant mortality rates. The most likely explanation is that higher tax rates enabled by elite cooptation are matched with local public goods provision, providing further evidence of a subantional fiscal contract.[19]

[19] Appendix Tables A15 and A16 repeat the analysis for the entire dataset and the urban subsample.

Conclusion

We demonstrate that post-independence powersharing across countries in Africa has, in part, been motivated by a fiscal logic—rulers have doled out access to state power to those groups whose members' economic production is a key source of revenue generation. Ethnic groups that produced cash crops in the colonial era were overrepresented in post-independence ruling coalitions and their power responds to temporal variation in the revenue potential of export crops. We observe divergent effects for mining and food crop producing groups, as well as for plantation agriculture. These types of resource production negated the need for bargaining with local intermediaries, albeit for different reasons. For mining and plantations, institutions of direct control and taxation reduced the need for local intermediaries, whereas food producers did not generate the same revenue potential as cash crops nor did they benefit from as powerful a network of elites who possessed the capabilities to demand representation. These general differences across resource types likely explain why we find no systematic differences in patterns of representation between British and non-British colonies. Metropolitan ideologies and policies, as well as their empire-specific institutional legacies, appear to matter less than the political economy of natural resources and revenue mobilization. Overall, our study shows that economic incentives and revenue potential may have been just as important in ethnic ruling coalition formation as the violent threat potential highlighted in the previous literature.

References

Afrifa, Akwasi Amankwaa. 1966. "The Ghana Coup: 24th February 1966." (London).

Amin, Samir. 1972. "Underdevelopment and Dependence in Black Africa – Origins and Contemporary Forms." *The Journal of Modern African Studies* 10 (4): 503–524.

Arriola, Leonardo R. 2013a. "Capital and Opposition in Africa: Coalition Building in Multiethnic Societies." *World Politics* 65 (2): 233–272.

— . 2013b. *Multi-Ethnic Coalitions in Africa: Business Financing of Opposition Election Campaigns*. New York: Cambridge University Press.

— . 2009. "Patronage and Political Stability in Africa." *Comparative Political Studies* 42 (10): 1339–1362.

Austin, Gareth. 1996. "Mode of Production or Mode of Cultivation: Explaining the Failure of European Cocoa Planters in Competition with African Farmers tn Colonial Ghana." In *Cocoa pioneer fronts since 1800: the role of smallholders, planters and merchants*, ed. by William Gervase Clarence-Smith, 154–175. Springer.

Auty, Richard M., ed. 2001. *Resource abundance and economic development*. Oxford University Press.

Bates, Robert H. 1981. *Markets and States in Tropical Africa: The Political Basis of Agricultural Policies*. Berkeley, CA: University of California Press.

Bates, Robert H, and Da-Hsiang Donald Lien. 1985. "A note on taxation, development, and representative government." *Politics & Society* 14 (1): 53–70.

Bazzi, Samuel, and Christopher Blattman. 2014. "Economic Shocks and Conflict: Evidence from Commodity Prices." *American Economic Journal: Macroeconomics* 6 (4): 1–38.

Berry, Sara. 1993. *No Condition is Permanent: The Social Dynamics of Agrarian Change in Sub-Saharan Africa*. Madison, WI: University of Wisconsin Press.

Boix, Carles, and Milan W Svolik. 2013. "The foundations of limited authoritarian government: Institutions, commitment, and power-sharing in dictatorships." *The Journal of Politics* 75 (2): 300–316.

Boone, Catherine. 2003. *Political Topographies of the African State: Territorial Authority and Institutional Choice*. New York: Cambridge University Press.

Bormann, Nils-Christian. 2019. "Uncertainty, cleavages, and ethnic coalitions." *The Journal of Politics* 81 (2): 471–486.

Cederman, Lars-Erik, Andreas Wimmer, and Brian Min. 2010. "Why do Ethnic Groups Rebel? New Data and Analysis." *World Politics* 62 (1): 87–119.

Christensen, Darin, and Michael Gibilisco. 2022. "How Budgets Shape Power Sharing in Autocracies." Working Paper.

Conley, Timothy G. 1999. "GMM Estimation with Cross Sectional Dependence." *Journal of Econometrics* 92 (1): 1–45.

Crowder, Michael. 1964. "Indirect Rule – French and British style." *Africa* 34 (3): 197–205.

FAO/IIASA. 2011. *Global Agro-Ecological Zones (GAEZ Version 3.0)*. Rome, Italy and Laxenberg, Austria: FAO / IIASA.

Francois, Patrick, Ilia Rainer, and Francesco Trebbi. 2015. "How is Power Shared in Africa?" *Econometrica* 83 (2): 465–503.

Gandhi, Jennifer, and Adam Przeworski. 2006. "Cooperation, cooptation, and rebellion under dictatorships." *Economics & politics* 18 (1): 1–26.

Gardner, Leigh. 2012. *Taxing Colonial Africa: The Political Economy of British Imperialism*. Oxford, UK: Oxford University Press.

Hance, William A, Vincent Kotschar, and Richard J Peterec. 1961. "Source Areas of Export Production in Tropical Africa." *Geographical Review* 51 (4): 487–499.

Hance, William Adams. 1964. *The Geography of Modern Africa*. New York: Columbia University Press.

Herbert, Eugenia W. 1984. *Red gold of Africa: Copper in Precolonial History and Culture*. Madison, WI: University of Wisconsin Press.

Hogendorn, Jan S. 1969. "Economic Initiative and African Cash Farming: Pre-Colonial Origins and Early Colonial Developments." In *Colonialism in Africa, 1870-1960: The Economics of Colonialism*, ed. by Lewis H. Gann and Duignan Peter, 283–328. London: Cambridge University Press.

Hopkins, Antony. 1973. *An Economic History of West Africa*. New York: Columbia University Press.

Horowitz, Donald L. 1985. *Ethnic Groups in Conflict*. Berkeley, CA: University of California Press.

Isaacman, Allen, and Richard Roberts. 1995. *Cotton, Colonialism, and Social History in Sub-Saharan Africa*. Portsmouth, NH: Heinemann.

Jacks, David S. 2013. "From Boom to Bust: A Typology of Real Commodity Prices in the Long Run." *Cliometrica*: 1–20.

Kasara, Kimuli. 2007. "Tax Me If You Can: Ethnic Geography, Democracy, and the Taxation of Agriculture in Africa." *American Political Science Review* 101 (1): 159–172.

Klein–Goldewijk, Kees, Arthur Beusen, and Peter Janssen. 2010. "Long-term dynamic modeling of global population and built-up area in a spatially explicit way: HYDE 3.1." *The Holocene* 20 (4): 565–573.

Levi, Margaret. 1989. *Of Rule and Revenue*. University of California Press.

Magaloni, Beatriz. 2008. "Credible power-sharing and the longevity of authoritarian rule." *Comparative political studies* 41 (4-5): 715–741.

Meng, Anne. 2020. *Constraining dictatorship: From personalized rule to institutionalized regimes*. Cambridge University Press.

Meng, Anne, and Jack Paine. 2021. "Power Sharing and Authoritarian Stability: How Rebel Regimes Solve the Guardianship Dilemma." *American Political Science Review*: 1–18.

MinEx. 2018. *Africa Deposit Database*. Melbourne: MinEx Consulting.

Mkandawire, Thandika. 2010. "On Tax Efforts and Colonial Heritage in Africa." *The Journal of Development Studies* 46 (10): 1647–1669.

Monfreda, Chad, Navin Ramankutty, and Jonathan A Foley. 2008. "Farming the Planet (2): Geographic Distribution of Crop Areas, Yields, Physiological Types, and Net Primary Production in the Year 2000." *Global biogeochemical cycles* 22 (1).

Moore, Mick. 2007. "How does taxation affect the quality of governance?" *IDS Working Paper Series*.

Müller-Crepon, Carl, Yannick Pengl, and Nils-Christian Bormann. 2022. "Linking Ethnic Data from Africa (LEDA)." *Journal of Peace Research* 59 (3): 425–435.

Murdock, George Peter. 1959. *Africa: Its Peoples and Their Culture History*. New York: McGraw-Hill.

— . 1967. "Ethnographic Atlas: A Summary." *Ethnology* 6 (2): 109–236.

North, Douglass C, and Barry R Weingast. 1989. "Constitutions and commitment: the evolution of institutions governing public choice in seventeenth-century England." *The journal of economic history* 49 (4): 803–832.

Nunn, Nathan. 2008. "The Long-term Effects of Africa's Slave Trades." *The Quarterly Journal of Economics* 123 (1): 139–176.

Paine, Jack. 2019. "Ethnic violence in Africa: Destructive legacies of pre-colonial states." *International Organization* 73 (3): 645–683.

— . 2021. "The Dictator's Power-Sharing Dilemma: Countering Dual Outsider Threats." *American Journal of Political Science* 65 (2): 510–527.

Pengl, Yannick I, Philip Roessler, and Valeria Rueda. 2022. "Cash Crops, Print Technologies, and the Politicization of Ethnicity in Africa." *American Political Science Review* 116 (1): 181–199.

Ramankutty, Navin, et al. 2002. "The Global Distribution of Cultivable Lands: Current Patterns and Sensitivity to Possible Climate Change." *Global Ecology and biogeography* 11 (5): 377–392.

Ricart-Huguet, Joan. 2021. "Colonial education, political elites, and regional political inequality in Africa." *Comparative Political Studies* 54 (14): 2546–2580.

Rodden, Jonathan. 2004. "Comparative federalism and decentralization: On meaning and measurement." *Comparative politics*: 481–500.

Roessler, Philip. 2016. *Ethnic Politics and State Power in Africa: The Logic of the Coup-Civil War Trap*. New York: Cambridge University Press.

— . 2011. "The Enemy Within: Personal rule, Coups, and Civil War in Africa." *World Politics* 63 (2): 300–346.

Roessler, Philip, and David Ohls. 2018. "Self-Enforcing Power Sharing in Weak States." *International Organization* 72 (2): 423–454.

Roessler, Philip, et al. 2022. "The Cash Crop Revolution, Colonialism and Economic Reorganization in Africa." *World Development*.

Ross, Michael L. 2004a. "Does taxation lead to representation?" *British journal of political science* 34 (2): 229–249.

— . 2004b. "What do we know about natural resources and civil war?" *Journal of peace research* 41 (3): 337–356.

— . 2015. "What have we learned about the resource curse?" *Annual Review of Political Science* 18:239–259.

Rothchild, Donald, and Michael W Foley. 1988. "African States and the Politics of Inclusive Coalitions." In *The Precarious Balance: State and Society in Africa*, ed. by Donald Rothchild and Naomi Chazan, 233–264. Westview Press.

Sokoloff, Kenneth L, and Stanley L Engerman. 2000. "Institutions, Factor Endowments, and Paths of Development in the New World." *Journal of Economic perspectives* 14 (3): 217–232.

Svolik, Milan W. 2012. *The politics of authoritarian rule*. Cambridge University Press.

Timmons, Jeffrey F. 2010. "Taxation and representation in recent history." *The Journal of Politics* 72 (1): 191–208.

USAID. 2012. "DHS Sampling and Household Listing Manual." *Retrieved on 15.7.2018*. %5Curl%7Bhttps://dhsprogram.com/pubs/pdf/DHSM4/DHS6_Sampling_Manual_Sept2012_DHSM4.pdf%7D.

Vogt, Manuel, et al. 2015. "Integrating Data on Ethnicity, Geography, and Conflict: The Ethnic Power Relations Dataset Family." *Journal of Conflict Resolution* 59 (7): 1327–1342.

WLMS. 2017. *World Language Mapping System Version 17*. Dallas, TX: SIL international & Global Mapping International.

Woolcock, Michael, Lant Pritchett, and Jonathan Isham. 2001. "The Social Foundations of Poor Economic Growth in Resource-rich Countries." In *Resource Abundance and Economic Development*, ed. by Richard M. Auty, 76–92. Oxford University Press Oxford.

Wucherpfennig, Julian, Philipp Hunziker, and Lars-Erik Cederman. 2016. "Who Inherits the State? Colonial Rule and Postcolonial Conflict." *American Journal of Political Science* 60 (4): 882–898.

Online Appendix (not for publication)

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Summary Statistics & Descriptives

Table A1: Summary Statistics (FRT CS Data)

Statistic	N	Mean	St. Dev.	Min	Max
Represented (Y/N)	261	0.559	0.347	0	1
Minister Share	261	5.697	7.333	0	44.796
Cash Crop Dummy	261	0.575	0.495	0	1
Mineral Dummy	261	0.134	0.341	0	1
Cash Crop Value p.c.	261	6.898	14.497	0	103.162
Mineral Value p.c.	261	4.444	26.482	0	367.144
Food Crop Value p.c. (M3)	260	9.041	17.091	0	183.317
Food Crop Value p.c. (FAO)	260	32.549	57.129	0.568	613.846
Agro-Climatic Cash Crop Suitability	261	0.221	0.086	0.036	0.451
Potential Cash Crop Yield at 1900 Prices	261	1.166	0.592	0.091	2.656
Group's Pop. Share	261	5.725	6.526	0.400	39
Agro-Climatic Suitability for Agriculture	261	0.393	0.223	02	0.864
Mean Elevation	261	612.660	501.275	13.288	2,224.026
Mean Slope	261	1.944	1.496	0.086	9.105
Distance to Coast, km	261	447.777	367.788	0.147	1,621.755
Distance to Capital, km	261	392.869	347.486	4.855	1,890.071
Number of Missions in 1924	261	2.563	6.046	0	60
Male Share with Secondary Educ.	134	0.347	0.240	0	1
Precolonial Agriculture	260	7.058	1.149	1.731	10
Precolonial Stateness	260	1.298	0.771	0	3
British Empire Dummy	261	0.487	0.501	0	1

Table A2: Summary Statistics (FRT TSCS Data)

Statistic	N	Mean	St. Dev.	Min	Max
Represented (Y/N)	10,967	0.560	0.496	0	1
Minister Count	10,967	1.475	2.271	0	20
Cash Crop Value (1e6 1960 USD)	10,967	3.662	15.899	0	358.967
Mineral Value (1e6 1960 USD)	10,967	1.641	8.736	0	131.417
Pot. Food Crop Value p.c. (1e6 1960 USD)	10,924	57.005	112.491	0.023	1,491.309
Group's Pop. Share	10,967	5.796	6.568	0.400	39
Agro-Climatic Suitability for Agriculture	10,967	0.390	0.222	0.001	0.864
Mean Elevation	10,967	595.414	493.442	13.288	2,224.026
Mean Slope	10,967	1.922	1.483	0.086	9.105
Distance to Coast, km	10,967	441.976	366.378	0.147	1,621.755
Distance to Capital, km	10,967	391.806	347.286	4.855	1,890.071
Precolonial Agriculture	10,924	7.075	1.134	1.731	10
Precolonial Stateness	10,924	1.297	0.770	0	3
Cash Crop Price Index	10,967	1.681	1.861	0	5.751
Mineral Price Index	10,967	0.296	1.008	0	6.417
Food Crop Price Index	10,924	5.317	0.341	4.605	5.807

Table A3: Summary Statistics (DHS Data)

Statistic	N	Mean	St. Dev.	Min	Max
Infant Death	922,386	10.911	31.178	0	100
Cash Crop Value (Mio. 1960 USD)	856,986	11.148	26.563	0	358.967
Represented (Y/N)	856,986	0.806	0.395	0	1
Minister Count	856,986	3.460	3.313	0	20
Mother's Education	922,363	1.659	0.794	1	4
Mother's Age	897,285	23.901	6.203	10	49
Birthorder	922,386	3.228	2.204	1	18
Female	922,386	0.489	0.500	0	1
Twin or higher multiple birth	922,386	0.035	0.184	0	1
Urban Survey Cluster	922,386	0.302	0.459	0	1
Year	922,386	1,992	8.499	1,960	2,004

Table A4: Summary Statistics (EPR Data)

Statistic	N	Mean	St. Dev.	Min	Max
Represented (Y/N)	265	0.546	0.437	0.000	1.000
Cash Crop Dummy	266	0.534	0.500	0	1
Cash Crop Value p.c.	254	4.561	10.455	0.000	100.250
Group's Pop. Share	266	0.184	0.213	0.0002	0.980
Agro-Climatic Cash Crop Suitability	266	2,806.023	1,485.459	0.000	6,276.021
Agro-Climatic Suitability for Agriculture	255	0.299	0.226	0.0001	0.892
Mean Elevation	255	658.371	447.870	14.199	1,811.228
Mean Slope	255	1.650	1.378	0.088	7.087
Distance to Coast, km	266	558.412	436.564	7.237	1,623.732
Distance to Capital, km	266	435.305	362.427	16.636	1,812.852
Precolonial Agriculture	255	5.928	1.984	1.000	10.000
Precolonial Stateness	253	1.453	0.882	0.000	3.000

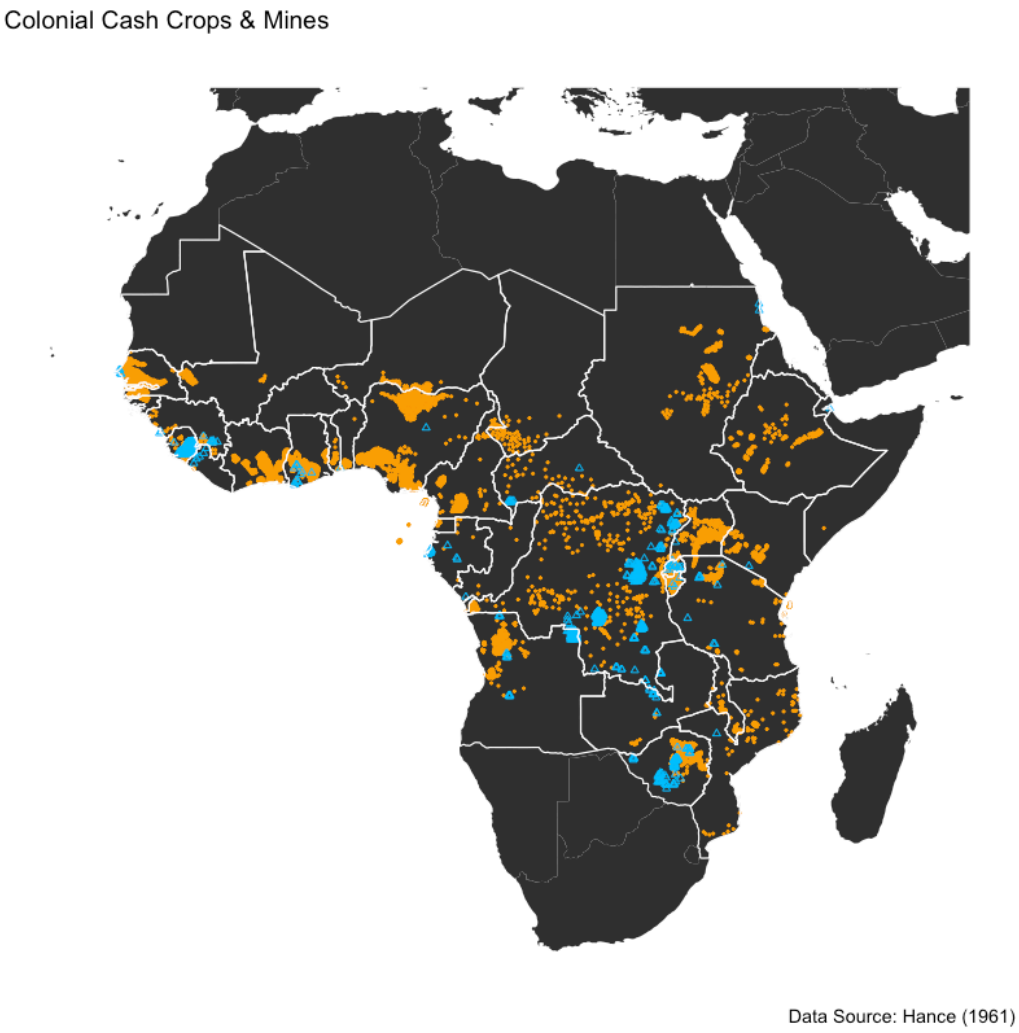

Figure A1: Production Locations of Colonial Cash Crop and Mineral Exports (Source: Hance, Kotschar, and Peterec (1961))

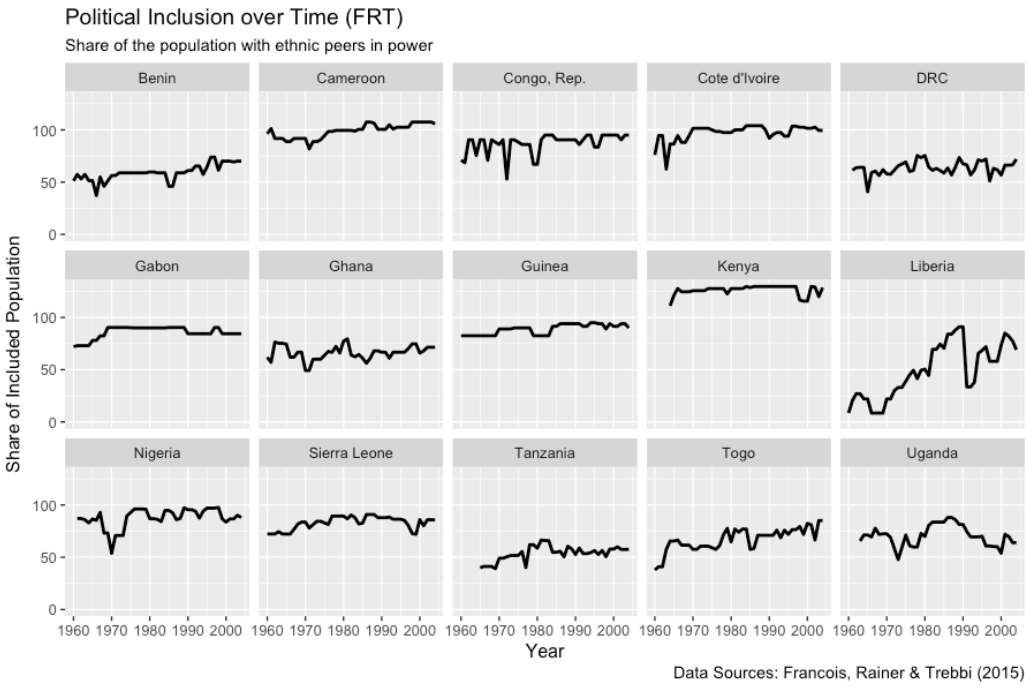

Figure A2: Shares of Politically Represented Population over Time (FRT data, 1960–2004)

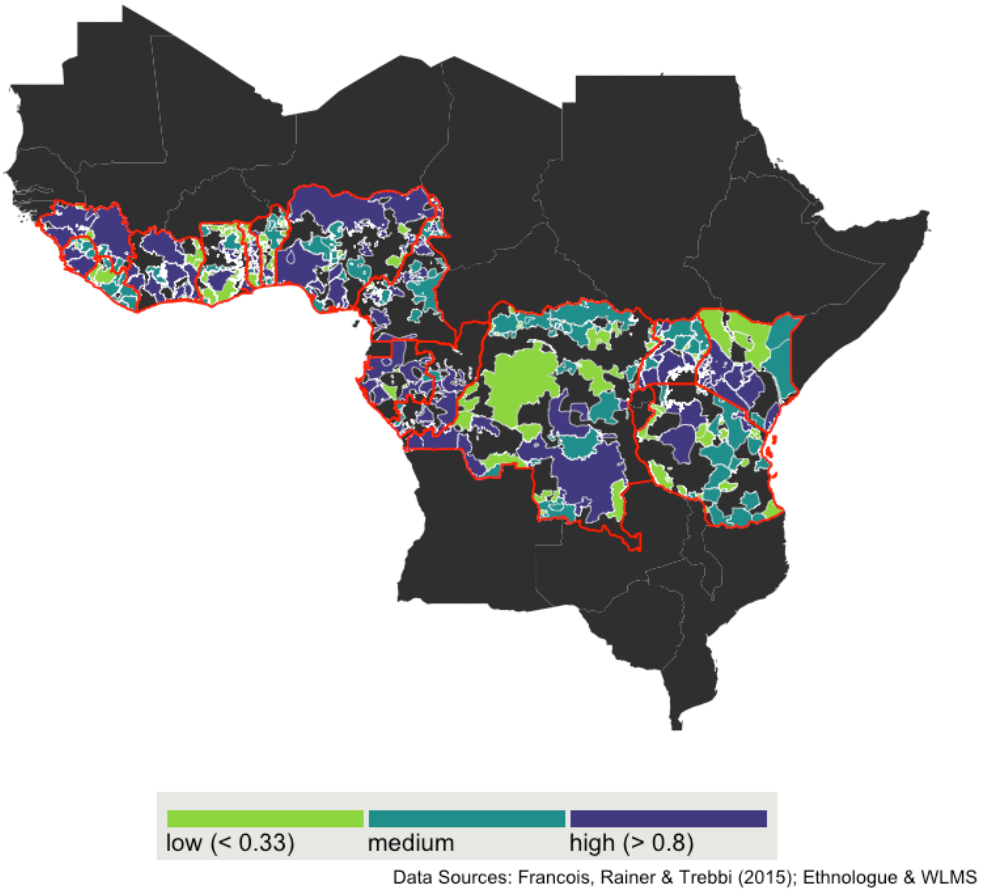

Figure A3: Share of Years with Political Inclusion, 1960–2004 (FRT Data & WLMS Polygons)

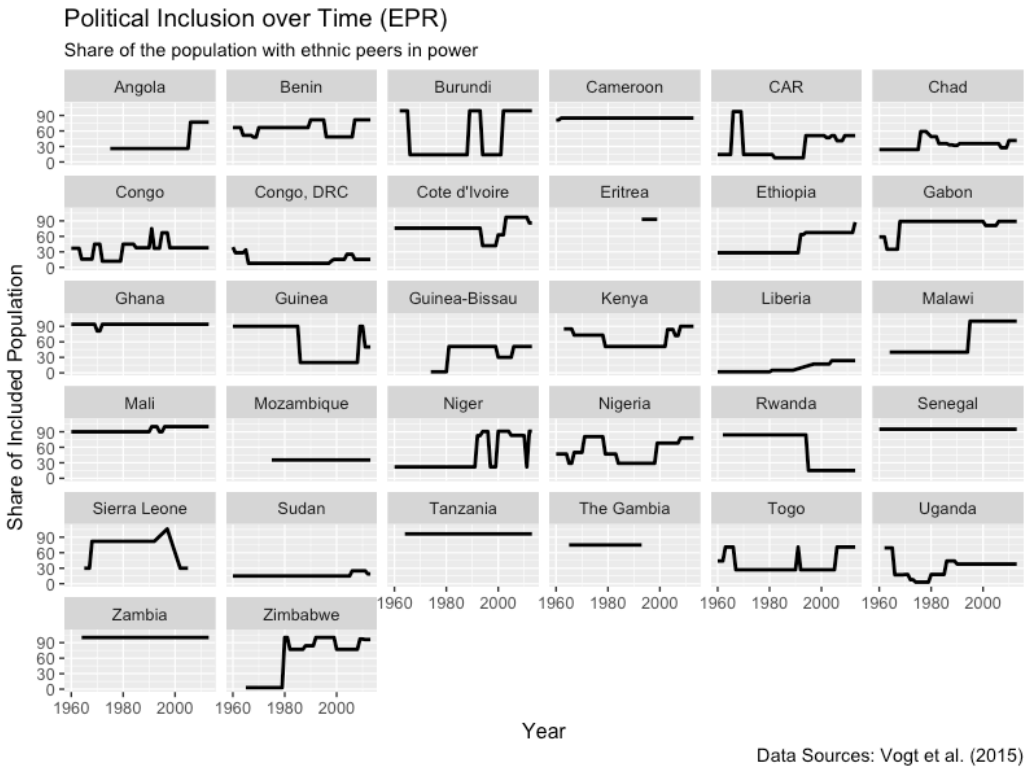

Figure A4: Shares of Politically Represented Population over Time (EPR Data, 1960–2013)

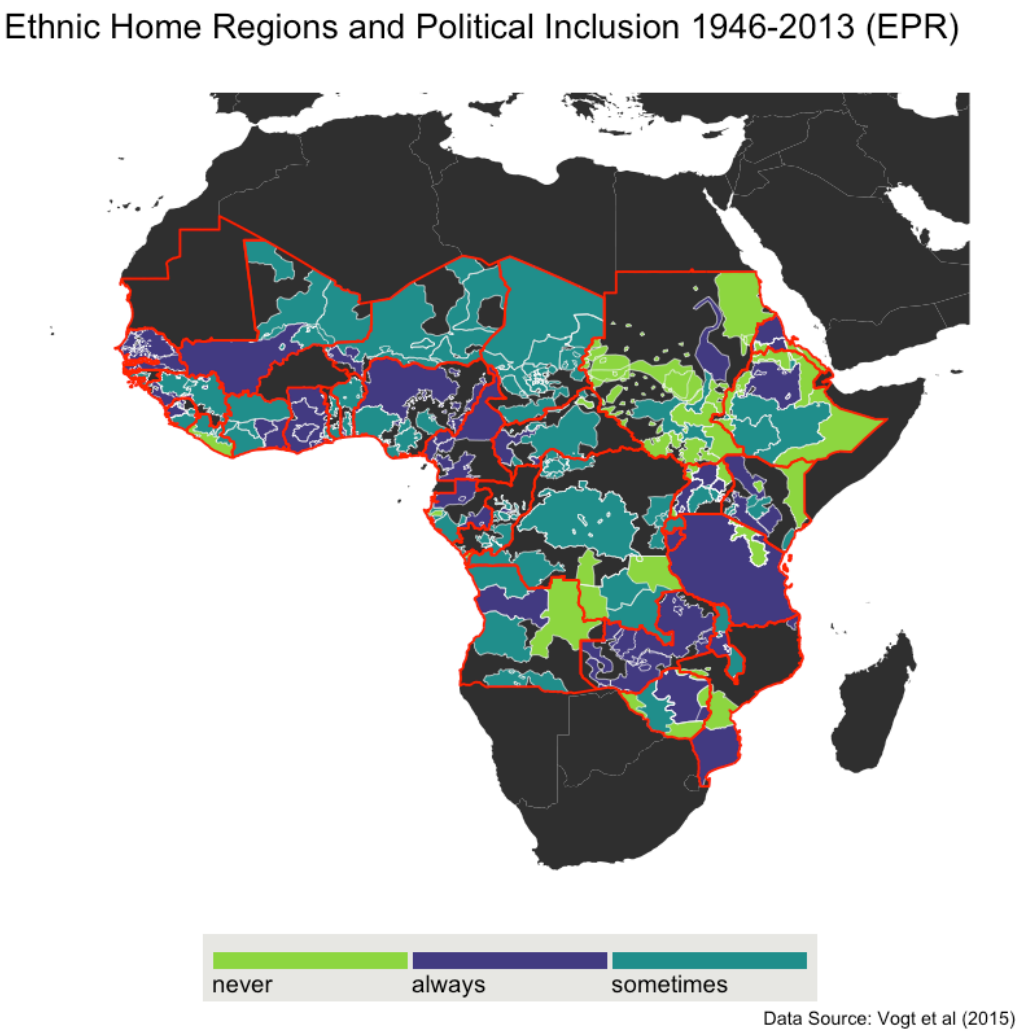

Figure A5: Share of Years with Political Inclusion, 1960–2013 (EPR Data & GeoEPR Polygons)

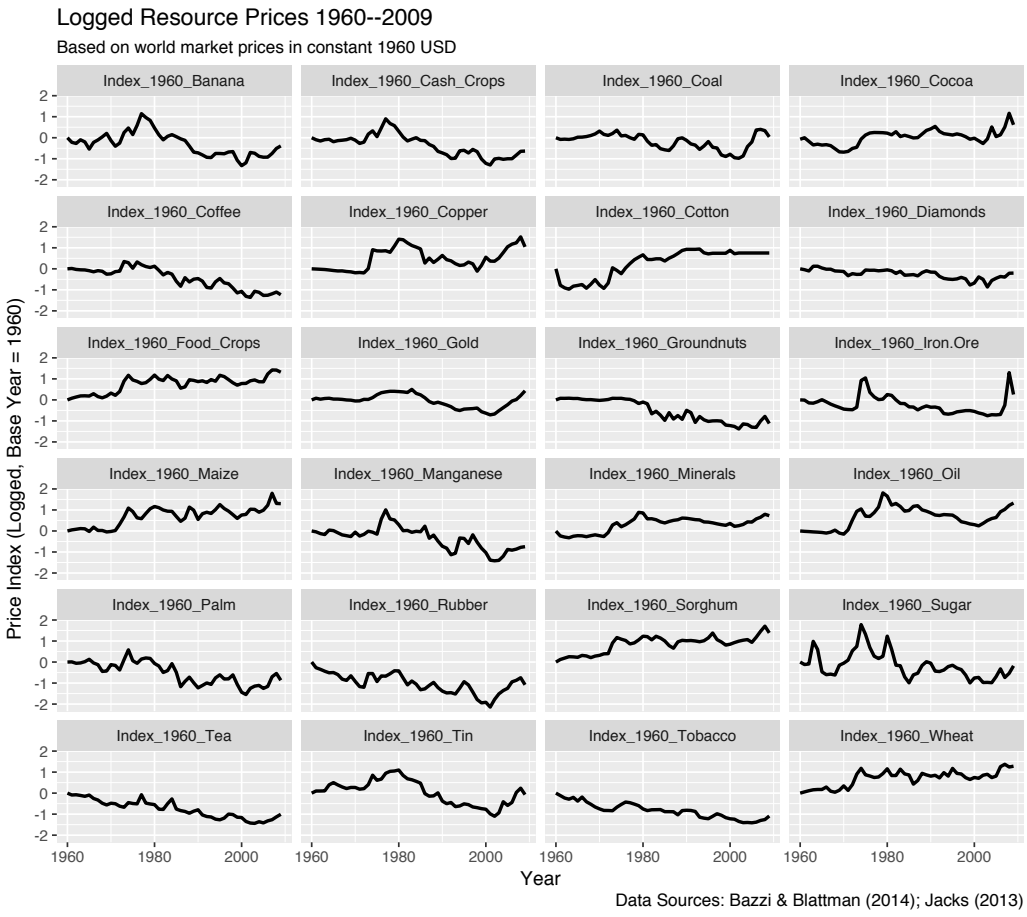

Figure A6: Logged Price Indices of Individual Crops & Minerals, 1960–2009

Robustness Tests (Cross-sectional Models)

Table A5: Standardizing Cash Crop Values by Area or Not at All

	Represented (Y/N)		Gov. Share (log)	
Cash Crops per sqkm (log)	0.015***		0.034***	
	(0.004)		(0.010)	
Cash Crop Value (log)		0.009***		0.020***
		(0.002)		(0.005)
Country FE	Yes	Yes	Yes	Yes
Baseline Controls	Yes	Yes	Yes	Yes
Observations	260	260	260	260

Notes: Linear models estimated via OLS. The sample means of the dependent variables are 0.56 (columns 1–2) and 0.057 (columns 3–4). Control variables include ethnic groups' population shares, mean elevation and terrain slope, soil and climatic suitability for agriculture, centroid distances to coast and capital city, precolonial reliance on agriculture and precolonial political centralization. Conley errors with 400 km distance cutoff in parantheses. Significance codes: *p<0.1; **p<0.05; ***p<0.01

Table A6: Robustness: Country-Clustered Standard Errors

	Represented (Y/N)		Gov. Share (log)	
Colonial Cash Crops (Y/N)	0.156***		0.336***	
	(0.034)		(0.084)	
Cash Crops per capita × price (log)		0.022***		0.049***
		(0.006)		(0.014)
Country FE	Yes	Yes	Yes	Yes
Baseline Controls	Yes	Yes	Yes	Yes
Observations	260	260	260	260

Notes: Linear models estimated via OLS. The sample means of the dependent variables are 0.56 (columns 1–2) and 0.057 (columns 3–4). Control variables include ethnic groups' population shares, mean elevation and terrain slope, soil and climatic suitability for agriculture, centroid distances to coast and capital city, precolonial reliance on agriculture and precolonial political centralization. Country-clustered standard errors in parentheses. Significance codes: *p<0.1; **p<0.05; ***p<0.01

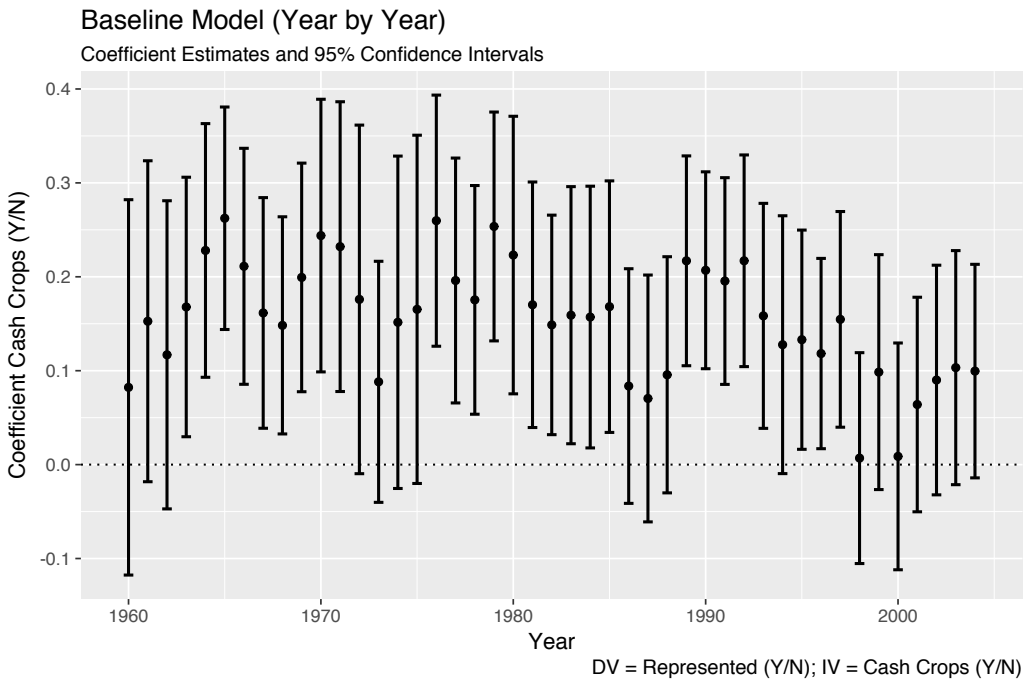

Figure A7: Year-by-Year Estimates of the Baseline Model in Column 1 of Table 2

Table A7: 2SLS-IV with Country-Clustered Standard Errors

	Represented (Y/N)		Gov. Share (log)	
Cash Crops (Y/N), fitted	0.313**		0.537**	
	(0.155)		(0.258)	
Cash Crops p.c. × price (log), fitted		0.041*		0.071**
		(0.022)		(0.036)
Country FE	Yes	Yes	Yes	Yes
Baseline Controls	Yes	Yes	Yes	Yes
First-Stage F	21.96	20.99	21.96	20.99
Observations	260	260	260	260

Notes: Instrumental variable models estimated via 2SLS. The sample means of the dependent variables are 0.56 (columns 1–2) and 0.057 (columns 3–4). Control variables include ethnic groups' population shares, mean elevation and terrain slope, soil and climatic suitability for agriculture, centroid distances to coast and capital city, precolonial reliance on agriculture and precolonial political centralization. Country-clustered standard errors in parentheses. Significance codes: *p<0.1; **p<0.05; ***p<0.01

Table A8: Reduced Form Estimates

	Represented (Y/N)		Gov. Share (log)	
Cash Crop Suitability	0.620***		1.063**	
	(0.225)		(0.432)	
Pot. Cash Crop Yield × price in 1900		0.081**		0.152**
		(0.033)		(0.060)
Country FE	Yes	Yes	Yes	Yes
Baseline Controls	Yes	Yes	Yes	Yes
Observations	260	260	260	260

Notes: Linear OLS models. The sample means of the dependent variables are 0.56 (columns 1–2) and 0.057 (columns 3–4). Control variables are the same as in the baseline and IV models above. Conley errors with 400 km distance cutoff in parentheses. Significance codes: *p<0.1; **p<0.05; ***p<0.01

Causal Mechanisms & Alternative Explanations (Cross-Sectional Models)

Smallholder vs. Plantation Crops. Based on our arguments that diffuse resources with sufficient revenue potential for incumbent rulers should increase the likelihood of representation, we only expect our cash crop results to hold for diffuse production by African smallholders. While this mode of production contributed the lion's share of African cash crop exports in the late colonial age, plantation-based production and European settler agriculture did occur in some places. In a recent contribution, Pengl, Roessler, and Rueda (2022) identify all country-crop combinations that likely deviate from the norm of African-run smallholder production. We use their classification to code, for each ethnic polygon in our sample, the total per capita value of smallholder and plantation-based cash crop production around independence. We also code binary indicators for these different forms of producing export crops. Equipped with these variables, we replicate our baseline model from Table 2 but now distinguish between smallholder and plantation cash crops. The results are reported in Table A9 and are well in line with our theoretical expectations. The baseline findings hold for smallholder cash crops, whereas plantation crops enter with small and insignificant coefficients.

Colonial Education? As discussed in the theory section of the main paper, colonial cash crop production is likely to be a compound treatment. In addition to the actual production of crops, colonial investments and institutions as well as local community structures and mobilization strategies emerged. Our theoretical argument

Table A9: Smallholder vs. Plantation Cash Crops

	Represented (Y/N)		Gov. Share (log)	
Smallholder Cash Crops (Y/N)	0.151***		0.319***	
	(0.034)		(0.080)	
Plantation Cash Crops (Y/N)	0.038		0.152	
	(0.036)		(0.104)	
Smallholder Crop Value p.c.		0.051**		0.112**
		(0.019)		(0.040)
Plantation Crop Value p.c.		−0.007		0.024
		(0.018)		(0.054)
Country FE	Yes	Yes	Yes	Yes
Baseline Controls	Yes	Yes	Yes	Yes
Observations	260	260	260	260

Notes: Linear OLS models. The sample means of the dependent variables are 0.56 (columns 1–2) and 0.057 (columns 3-4). Control variables include ethnic groups' population shares, mean elevation and terrain slope, soil and climatic suitability for agriculture, centroid distances to coast and capital city, precolonial reliance on agriculture and precolonial political centralization. Conley errors with 400 km distance cutoff in parantheses. Significance codes: *p<0.1; **p<0.05; ***p<0.01

holds that a combination of early elite formation, collective action experience, and strategic calculations by incumbent rulers explain cash cropping groups' advantages. Without data on the identities of pre-independence African elites, political organization, and instances of mobilization, we cannot directly test the supply-side mechanisms. Note that our account of early elite formation stresses African opportunities for accumulation and the corresponding desire for formal education and upward mobility. Ricart-Huguet (2021) points to a compelling alternative pathway: the spatial effects of colonial education investments mediated the capabilities of elites competing for political office. He uses numbers of public and missionary teachers per colonial district and decadal cross-sections of cabinet ministers' birthplaces to estimate the effect of education investments. Results indicate that districts with higher education investments are overrepresented in post-independence governments. However, one limitation of this approach—in light of the importance of commercial export agriculture on institutional legacies—is educational investments are likely endogenous to cash crop production. Moreover, we expect that in building coalitions rulers prioritize the need for reliable local intermediaries and indirect tax revenues as much as they may favor educated elites from the leading secondary schools and universities. Again, it is hard to directly test these mechanisms. What we can do, however, is to rerun our baseline models and account for educational investments and the availability

Table A10: Controlling for Educational Investments

	Represented (Y/N)		
Colonial Cash Crops (Y/N)	0.144***	0.141**	0.142**
	(0.040)	(0.067)	(0.068)
No. Missions in 1924 (log)	0.033		−0.004
	(0.024)		(0.032)
Male Share with Secondary Educ.		0.373**	0.373**
		(0.148)	(0.149)
Country FE	Yes	Yes	Yes
Baseline Controls	Yes	Yes	Yes
Observations	260	133	133

Notes: Linear OLS models. The sample means of the dependent variable is 0.56. Control variables include ethnic groups' population shares, mean elevation and terrain slope, soil and climatic suitability for agriculture, centroid distances to coast and capital city, precolonial reliance on agriculture and precolonial political centralization. Conley errors with 400 km distance cutoff in parantheses. Significance codes: *p<0.1; **p<0.05; ***p<0.01

of skilled candidates.

We use Roome's (1924) map of Christian missions in 1924 and, as a proxy for early educational investment, count the number of missions per ethnic group polygon.[20] To more directly approximate the supply of educated elites we use DHS survey data (USAID 2012). More specifically, we use all available DHS survey rounds in which male respondents were interviewed in any of the 15 FRT countries. We first restrict the sample to all surveys that contain information on respondents' ethnic identity. As a result, we lose Liberia, Congo-Brazzaville, and Tanzania. To assign survey respondents to FRT groups, we then match the ethnic information from DHS to FRT via Ethnologue's linguistic categories. In a third step, we code, for each FRT group, the share of respondents born before 1960 with at least some secondary education. The calculations are based on a total of 25'544 respondents and the mean secondary education rate across all ethnic groups is about 35%. Not all FRT groups are represented among DHS respondents, which implies further restrictions in sample size. Nonetheless, Table A10 shows that our results are stable to including the logged mission count, male education shares, or both of these variables to the model. The coefficients on the more direct and survey-based proxy is positive, substantively large and highly significant. Yet despite losing half of all observations, the cash crop effect is only minimally smaller and remains significant at the 95% confidence level.

[20] Roome's map has been digitized by Nathan Nunn (2010).

Table A11: British vs. Non-British Colonies

	Represented (Y/N)		Gov. Share (log)	
Cash Crops (Y/N)	0.116***		0.244**	
	(0.043)		(0.101)	
Cash Crops (Y/N) × British	0.077		0.178	
	(0.062)		(0.173)	
Cash Crop Value p.c.		0.017***		0.040***
		(0.006)		(0.014)
Cash Crops p.c. × British		0.011		0.021
		(0.010)		(0.024)
Country FE	Yes	Yes	Yes	Yes
Baseline Controls	Yes	Yes	Yes	Yes
Observations	260	260	260	260

Notes: Linear OLS models. The sample means of the dependent variables are 0.56 (columns 1–2) and 0.057 (columns 3–4). Control variables include ethnic groups' population shares, mean elevation and terrain slope, soil and climatic suitability for agriculture, centroid distances to coast and capital city, precolonial reliance on agriculture and precolonial political centralization. Conley errors with 400 km distance cutoff in parantheses. Significance codes: *p<0.1; **p<0.05; ***p<0.01

This suggests that early cash crop elites' commercial and political rather than mere educational clout is likely to explain our findings.

British Indirect Rule?. As discussed above, native cash crop revolutions tended to happen later in non-British colonies. We have argued that opportunities for capital accumulation and political mobilization in cash crop areas arose due to relatively indirect forms of rule. One might suspect that indirect rule of cash crop regions was more common in British than in non-British colonies (Wucherpfennig, Hunziker, and Cederman 2016; Müller-Crepon 2020). On the ground, however, similar structural conditions led to similar colonial strategies, at least from the 1920s onward. To more formally assess this claim, we rerun our baseline models and interact the binary and continuous cash crop proxies with a British Empire dummy. Results are presented in Table A11. The coefficient on the constitutive cash crop terms remain positive and highly significant. They show the estimated effects for non-British colonies. The coefficients are 26–27% smaller than in the baseline specifications from Table 2 in the main paper. However, the interaction terms are never significant. In line with our theoretical arguments, we cannot reject the hypothesis that the cash crop effect is the same in former British and non-British colonies.

Table A12: Cash Crops and EPR Political Inclusion (1960-2013)

	Share of Years Included (EPR)			
Colonial Cash Crops (Y/N)	0.066	0.066		
	(0.082)	(0.074)		
Cash Crop Value per capita			0.023*	0.023*
			(0.014)	(0.013)
Country FE	Yes	Yes	Yes	Yes
Baseline Controls	Yes	Yes	Yes	Yes
Country-Clustered SE	Yes	No	Yes	No
Conley Errors (400 km)	No	Yes	No	Yes
Observations	195	195	195	195

Notes: OLS and 2SLS-IV models. The sample means of the dependent variable is 0.54. Control variables include ethnic groups' population shares, mean elevation and terrain slope, soil and climatic suitability for agriculture, centroid distances to coast and capital city, precolonial reliance on agriculture and precolonial political centralization. Country-clustered standard errors in parentheses. Significance codes: *p<0.1; **p<0.05; ***p<0.01

Replication with EPR. As a further robustness check, we replicate the cross-sectional baseline models based on EPR data on political inclusion. We use the GeoEPR polygons to assign cash crops to ethnic homelands. Politically relevant EPR groups and their respective polygons are time-varying. For the present purpose, we restrict the sample to all groups that were already coded as relevant in the first year after independence. The resulting dataset contains 195 ethnic groups nested in 32 African countries. Table A12 reports our findings. The coefficients on the colonial cash crop dummy are positively signed but 60% smaller than in Column 1 of Table 2 in the mian text. They do not reach statistical significance. This may have to do with the larger ethnic polygon size and less fine-grained spatial variation than in the linguistic FRT polygons. The continuous measure of per capita production values indicates a positive effect that is significant at the 90% confidence level, regardless of whether we cluster errors by country or use Conley's (1999) method. The coefficient size is practically identical to what we find in Table 2. Similar results from two independently collected data sources on political representation should increase our confidence that there is an effect.[21]

[21]We do not report IV estimates based on EPR data, since first-stage instrument strength is clearly insufficient. Again, this is likely due to a smaller sample of relatively large ethnic polygons that include productive cash crop zones as well as larger rural hinterlands that are unsuitable for cash crops.

Robustness Tests (TSCS Models)

Table A13: Scaling Price Effects by Cash Crop Levels

	Represented (Y/N)		Minister Count (log)	
Cash Crop Value × Price (log)	0.066**		0.429**	
	(0.027)		(0.205)	
Cash Crop Value p.c. × Price (log)		0.066**		0.428**
		(0.027)		(0.206)
Group FE	Yes	Yes	Yes	Yes
Country-Year FE	Yes	Yes	Yes	Yes
Observations	10,967	10,967	10,967	10,967

Notes: Linear OLS models. The sample means of the dependent variables are 0.56 (columns 1–2) and 1.47 (columns 3–4). Control variables in columns 2 and 4 are the same as in the cross-sectional models above. Two-way clustered standard errors in parentheses: Ethnic group and country-year clusters. Significance codes: *p<0.1; **p<0.05; ***p<0.01

Table A14: Dropping Ghana and Côte d'Ivoire

	Represented (Y/N)		Minister Count (log)	
Cash Crop Weights × Price (log)	0.124***	0.110**	0.763**	0.742**
	(0.039)	(0.048)	(0.311)	(0.332)
Group FE	Yes	Yes	Yes	Yes
Country-Year FE	Yes	Yes	Yes	Yes
Controls × Year Dummies	Yes	Yes	Yes	Yes
Observations	9,471	9,428	9,471	9,428

Notes: Linear OLS models. The sample means of the dependent variables are 0.56 (columns 1–2) and 1.47 (columns 3–4). Control variables in columns 2 and 4 are the same as in the cross-sectional models above. Two-way clustered standard errors in parentheses: Ethnic group and country-year clusters. Significance codes: *p<0.1; **p<0.05; ***p<0.01

Additional Results (Fiscal Contract)

Table A15: Cash Crop Values, Political Representation & Urban Infant Mortality

	Infant Mortality		
	(1)	(2)	(3)
Cash Crops × Price (log)	0.547	0.625	0.588
	(0.575)	(0.579)	(0.587)
Represented (Y/N)		−0.453	
		(0.947)	
Minister Count (log			−0.295
			(0.778)
Cash Crop Value × Represented (Y/N)		−0.095	
		(0.179)	
Cash Crop Value × Minister Count			−0.050
			(0.126)
Ethnic Group FE	Yes	Yes	Yes
Country-Survey-Round-Cohort FE	Yes	Yes	Yes
Individual Controls	Yes	Yes	Yes
Observations	262,771	262,771	262,771

Notes: Linear probability models estimated via OLS. The sample mean of the dependent variable is 10.76 infant deaths per 100 live births. Observations are weighted to ensure equal weights for each ethnic group. Control variables include mothers' education, age and age squared, as well as newborns' sex, a twin dummy, birth rank, and birth rank squared. Standard errors clustered by ethnic group in parentheses. Significance codes: *p<0.1; **p<0.05; ***p<0.01

Table A16: Cash Crop Values, Political Representation & Infant Mortality

	Infant Mortality		
	(1)	(2)	(3)
Cash Crops × Price (log)	−0.812**	−0.820**	−0.822**
	(0.390)	(0.391)	(0.393)
Represented (Y/N)		−0.085	
		(0.635)	
Minister Count (log)			−0.221
			(0.631)
Cash Crop Value × Represented (Y/N)		0.019	
		(0.119)	
Cash Crop Value × Minister Count			0.025
			(0.101)
Ethnic Group FE	Yes	Yes	Yes
Country-Survey-Round-Cohort FE	Yes	Yes	Yes
Individual Controls	Yes	Yes	Yes
Observations	879,922	879,922	879,922

Notes: Linear probability models estimated via OLS. The sample mean of the dependent variable is 10.01 infant deaths per 100 live births. Observations are weighted to ensure equal weights for each ethnic group. Control variables include mothers' education, age and age squared, as well as newborns' sex, a twin dummy, birth rank, and birth rank squared. Standard errors clustered by ethnic group in parentheses. Significance codes: *p<0.1; **p<0.05; ***p<0.01

References

Conley, Timothy G. 1999. "GMM Estimation with Cross Sectional Dependence." *Journal of Econometrics* 92 (1): 1–45.

Hance, William A, Vincent Kotschar, and Richard J Peterec. 1961. "Source Areas of Export Production in Tropical Africa." *Geographical Review* 51 (4): 487–499.

Müller-Crepon, Carl. 2020. "Continuity or change?(In) direct rule in British and French colonial Africa." *International Organization* 74 (4): 707–741.

Nunn, Nathan. 2010. "Religious Conversion in Colonial Africa." *American Economic Review* 100 (2): 147–52.

Pengl, Yannick I, Philip Roessler, and Valeria Rueda. 2022. "Cash Crops, Print Technologies, and the Politicization of Ethnicity in Africa." *American Political Science Review* 116 (1): 181–199.

Ricart-Huguet, Joan. 2021. "Colonial education, political elites, and regional political inequality in Africa." *Comparative Political Studies* 54 (14): 2546–2580.

Roome, William R. M. 1924. *Ethnographic Survey of Africa: Showing the Tribes and Languages; Also the Stations of Missionary Societies [map].*

USAID. 2012. "DHS Sampling and Household Listing Manual." *Retrieved on 15.7.2018*. %5Curl%7Bhttps://dhsprogram.com/pubs/pdf/DHSM4/DHS6_Sampling_Manual_Sept2012_DHSM4.pdf%7D.

Wucherpfennig, Julian, Philipp Hunziker, and Lars-Erik Cederman. 2016. "Who Inherits the State? Colonial Rule and Postcolonial Conflict." *American Journal of Political Science* 60 (4): 882–898.