The Economic Basis of African Ruling Coalitions

Cash Crops, Minerals, and Ethnic Representation

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Abstract. The unequal representation of ethnic groups in African governments is often seen as key driver of political instability, economic inequality, and comparatively low levels of development. While the consequences of unrepresentative ruling coalitions become increasingly clear, we know less about their formation. Only recently have scholars begun to study how threats of coups and rebellions translate into political power where weak institutions fail to regulate political competition between ethnic groups. A key implication from this literature is the relevance of demographic size and proximity to the capital for group-level access to government posts. We move beyond these important factors and investigate the economic foundations of ethnic ruling coalitions. More specifically, we study how natural resource endowments and revenues affect ethnic groups' representation in national governments. To that end, we combine information on the ethnic affiliation of African cabinet ministers with newly collected data on the geospatial location of major export commodities in the late colonial period. Based on these data, we show that cash crop-producing regions are overrepresented in African post-independence ruling coalitions while mining or food-producing locations are not. To estimate causal effects, we instrument colonial cash crops with agro-climatic suitability scores and exploit plausibly exogenous variation in global commodity prices. We discuss elite formation, threat capabilities, and revenue maximization as potential causal mechanisms underlying these findings.

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Introduction

What explains differential access of African ethnic groups to state power? In this paper, we argue that the spatial distribution of colonial export commodity production had powerful effects on different ethnic groups' representation in post-colonial ruling coalitions. More specifically, we outline how different resource types and production modes shaped colonial institution building and led to significant ethno-regional differences in terms of elite formation and political mobilization. After independence, the economic importance, as well as production and taxation modes of export commodities, shaped bargaining processes between incumbent rulers and ethnic elites from resource-rich areas. We argue that ethnic groups that were the main producers of colonial cash crops gained early political advantages that have persisted over time. As a result, they are more likely to be represented in post-colonial cabinets. In addition to supply-side factors at the ethnic group level, incumbent rulers' demand for coalition partners determines representation levels. Controlling production and directly taxing diffuse agricultural resources is difficult. However, export crops can be taxed indirectly through trade taxes and marketing boards. African rulers frequently rely on local intermediaries to regulate access to farmland, maintain support, and assure acquiescence to indirect taxation in cash crop areas (Kasara 2007; Boone 2003). Local intermediaries are less crucial in mineral or food producing regions. Capital-intensive point resources are easier to directly control and tax (Le Billon 2001). Locally traded agricultural resources provide lower revenue potential and cannot be taxed at the port. Therefore, incumbents face stronger incentives to co-opt cash crop elites than candidates from mineral or staple crop producing regions. Alliances with ethnic cash crop elites is likely to vary with the market value and revenue potential of the resources their constituents produce.

In the empirical part of this paper, we combine newly collected spatial data on colonial export production 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 7

years longer in post-colonial cabinets than their mineral or food producing counterparts. Instrumental variable models suggest that this effect is causal. We complement these cross-sectional results with an analysis of how plausibly exogenous changes in global cash crop prices affect individual 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 2018), British legacies of indirect rule (Crowder 1964), or mere co-optation schemes that exploit cash crop regions to the benefit of supposedly more powerful urban constituencies (Bates 1981; Kasara 2007).

Our findings speak to two important strands of the literature. First, we contribute to the understanding of political representation and ethnic coalition building in Sub-Saharan Africa. While many studies have outlined the consequences of unequal representation in terms of material well-being and armed conflict (see e.g. Franck and Rainer 2012; Horowitz 1985; Cederman, Gleditsch, and Buhaug 2013), we know less about the origins of ethnic ruling coalitions. A recent literature has begun to fill this gap. One of us has shown how the threat of coups in weakly institutionalized coalition regimes may motivate ethnic exclusion (Roessler 2011, 2016; Roessler and Ohls 2018). Francois, Rainer, and Trebbi (2015) formalize parts of Roessler's argument but argue that African rulers' need to balance external and internal threats result in relatively representative coalitions. On the empirical end, both accounts agree that ethnic groups' population size affects their threat potential and, in turn, chances of inclusion. Roessler and Ohls (2018) show that geographic proximity to the capital city is equally important. In the present paper, we add economic aspects to the picture. This is in line with Arriola (2013b, 2013a), who stresses the fundamental role of capital and business support in effectively mobilizing inter-ethnic opposition coalitions in multi-party elections. In contrast to Arriola, we focus on the historical roots of mobilizational capacity and do not restrict our focus to electoral contexts. In addition, our analysis is at the individual group rather than the coalition or country level. Wucherpfennig, Hunziker, and Cederman (2016) argue that British indirect

rule led to better representation of geographically remote groups than French direct rule. Our resource related results do not vary with respect to metropolitan identity.

Second, we contribute to the broader literature of colonial legacies. A series of empirical studies has investigated the economic effects of colonialism at the country and subnational levelx. In a pioneering set of studies, Acemoglu, Johnson, and Robinson (2001, 2002) attribute cross-country differences in economic development to extractive or inclusive colonial institutions. At the subnational level, scholars have pointed out more positive legacies of colonial investments in education, health and physical infrastructure (Huillery 2009; Jedwab and Moradi 2016; Cagé and Rueda 2016). We highlight political rather than economic legacies. In discussing the historical context of colonial resource production, we point at the potential endogeneity of colonial institutions and investments. Moreover, we show that the relevance of colonial resource legacies varies over time.

The remainder of our paper is structured as follows. Section 2 provides an historical account of how the commercial transition from slave trading to 'legitimate' trade in export commodities shaped colonial strategies at the subnational level. Section 3 derives hypotheses about the long-term effects of colonial resource extraction mediated resource mobilization, political competition and ethnic groups' representation in post-colonial ruling coalitions. Section 4 describes our data and is followed by two empirical sections (5 & 6) where we present our research designs and quantitative results. Section 7 concludes.

Historical Context

The 19th Century Commercial Transition in Africa

The commercial transition from slave trading to so-called "legitimate trade" in natural resources marks a watershed in African history. With the end of the slave trade, demand for agricultural products in Africa took off (Hogendorn 1975; Hopkins 1973). The cash crop revolution, which would spread and intensify over the next 150 years,

would reshape Africa's economic geography (Roessler et al. 2019; Hance 1964).

The main resources of the first, largely West African, commercial transition were vegetable oils and oil seeds. Palm oil was extracted from the greasy flesh of the palm fruit. Palm kernels and groundnuts were shipped out in raw form and processed in Europe. Apart from culinary uses, vegetable oils served as lubricant for machinery and railways and formed the basis of soap, candle, margarine, and nitroglycerine production (Lynn 2002; Hopkins 1973). African cotton and coffee became prominent export commodities in the late 19th century. The same goes for the non-native cocoa crop which rapidly spread through the coastal West African forest zones from about 1880 onward (Coe and Coe 2013; Clarence-Smith and Topik 2003). Natural gums and rubber were important from the mid-19th to early 20th century but quickly lost in significance, partially due to competition from Malaysia (Berry 1993).

The rise of cocoa in the British Gold Coast Colony from 1880s onwards is perhaps the most striking example of an African-led cash crop revolution. Cocoa was first planted in the southeastern Akim Abuakwa area but rapidly spread north and west to the Ashante and Brong-Ahafo regions. By 1911 the Gold Coast was the world's leading cocoa exporter (Ross 2014). The British were initially more interested in gold and did not do much to stimulate the cocoa boom. The crucial exception was the early construction of railways from the coast to mining areas. Without rail transportation, the less coastal areas could not have adopted cocoa so quickly (Hogendorn 1975; Jedwab and Moradi 2016). In the early southeastern boom, agricultural entrepreneurs and "rural capitalists" were the driving force (Hill 1997). They quickly expanded the cocoa frontier by pooling capital and labor resources they had acquired in earlier palm oil trades (Green and Hymer 1966). In Asante and Brong Ahafo, the Akan chiefs capitalized on their control of land and labor that had previously been channeled into gold mining and the kola nut trade (Hogendorn 1975; Manning 1969). They liberally leased out new cocoa land to local and, increasingly, in-migrating commoners (Ross 2014). Traditional gold mining in Asante collapsed in the wake of the cocoa boom. Progressively free labor secured higher returns in the cocoa than the mineral sector, which increasingly concentrated at the big deposits of Tarkwa and

Obuasi (Hogendorn 1975). In short, African coalitions of entrepreneurs, smallholders, and precolonial elites coproduced the cocoa miracle in spite, rather than because of European colonial advances (Green and Hymer 1966). In 1924, a French observer accurately noted:

> "Forget the proverb that there is nothing new under the sun – or at least cite cocoa in the Gold Coast as an exception. In the history of the world there has certainly never been such rapid development of an entire economic sector launched by the local inhabitants." (cited in Ross (2014, p. 59))

Even where European encouragement or coercion were present, African producer and elite coalitions often shaped what was planted where and when. The British Cotton Growing Association introduced American cotton to Uganda and the Germans promoted coffee production in Tanganyika. However, the Buganda and Chagga chiefs were prime agents behind the widespread adoption of these crops by native producers (Wrigley 1957, 1960; Iliffe 1979). While smallholders in the Ugandan Lango and Busoga regions initially resisted or, at times, abandoned cotton to preserve food security, they readily planted the crop when the terms-of-trade were favorable (Tosh 1980; Austin 2014; Nayenga 1981). In Kenya and Côte d'Ivoire, colonial land expropriation, white settler privilege, and labor coercion long delayed the growth of native cash crop production. African political mobilization against these policies from the 1920s onwards and their eventual removal in the late colonial age spurred veritable booms (Frankema, Green, and Hillbom 2016). Ivorian coffee and cocoa exports only went through the roof after labor restrictions were lifted. Native planters easily outcompeted the small number of government-protected European settlers who had dominated the trade before (Chauveau and Léonard 1996).

Colonialism and the Revenue Imperative

Regardless of whether imperial powers reluctantly or enthusiastically scrambled for Africa, once they did, they had to finance their acquisitions. Metropolitan govern-

ments and their constituencies saw African colonies as potential financial burden and, by and large, questioned their fiscal value. Apart from military expenses and few large grants for infrastructure development, Metropolitan treasuries did little to finance their colonial outposts. Instead, the goal was to achieve fiscal self-sufficiency and make African subjects "pay for their own conquest" (Beissinger and Young 2002, p, 29). To achieve the *mise en valuer* of the colonies, governments were in desperate need to find local revenue sources and develop taxation regimes to exploit them (Sarraut 1923). This contributed to the acceleration and expansion of the cash crop revolution in Africa (Gann and Duignan 1969; Havinden and Meredith 1993).

Areas of commercial agricultural production shifted beyond coastal bands to suitable enclaves in the hinterland—driven by local farmers responding to increased market demand (e.g., cocoa farming in Gold Coast or groundnut production in northern Nigeria), state-led development schemes (e.g., cotton production in Chad or Sudan), and the establishment of plantations by European settlers. To support production, the colonial government invested in cash crop enclaves—building roads and railways, processing centers, power generation plants, hospitals and schools, and administrative offices. These initial investments would have important orienting effects on the colony's development—generating strong clustering effects of transport facilities, infrastructural projects, such as irrigation schemes, dams or power plants, administrative centers, health and education services, and police posts.

Thus, the end of the slave trade and the opening of the region to "legitimate" commerce increased demand for cash crops, which in turn increased the value of areas highly suitable for cash crops (though not for areas generally suitable for agriculture but unfavorable for cash crops) that attracted colonial investments and engendered economic clustering and increasing returns to scale.

However, constrained by high transport costs due to lack of existing infrastructure and navigable rivers, administrative costs that came with supporting multiple economic enclaves, and general reluctance to sink investments into territories that were viewed as costly and unprofitable (Coquery-Vidrovitch 1969), colonial economies specialized both in terms of the number of crops it supported and their

geographic location. This produced an extractive but highly uneven state.

Markets for land, labor, capital and output were organized in interventionist and, from a European perspective, unconventional ways. All four markets contained redistributive and essentially political features. In mining and plantation areas, access to government-controlled land, cheap labor, capital, and output marketing opportunities depended on racial identity and government favoritism. In cash crop areas, land and labor mobilization were contingent on communal identity or local patronage. Some opportunities for capital accumulation and trading were open to natives. The advent of the marketing board put output markets under state control. Cash crop and mining regions saw faster growth of increasingly diverse populations than other agricultural areas or labor reserves. All four markets were structured in ways that made control of the central state or local authority structures useful strategies to accumulate wealth and power. Upward mobility required access to national or local patronage networks.

Cash Crops, Resource Mobilization and Competition for State Power

From the 1920s and 30s onward, rising political consciousness and African resistance achieved initially modest but increasingly successful gains. Rural and urban protest against restrictive economic policies and labor repression as well as calls for political representation began to spread through African empires. Especially after World War II, these activities intensified. 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. Suddenly and without much preparation, Africans came to control newly independent states. Who were the Africans in charge? From which regions and backgrounds did the new elite of post-independence presidents, ministers, and high-ranking officials emerge? Put differently, how was political power distributed across regions and ethnic groups?

One key aim of colonial institutions was to restrict African resistance and political mobilization. Indirect rule under supposedly traditional institutions was intended to suppress any unified nationalist sentiment. (Mamdani 1996) Limits on African accumulation, permanent settlement in mining towns, and political association served to prevent the rise of modern class-based or anti-colonial movements. Africans managed to first gradually and later explosively subvert these schemes. The spatial variation in colonial institutions and economic activity provided early opportunities for elite formation and political mobilization in some places but not in others. These early differences were to shape access to political power for a long time.

In explaining differential access to central state power among regions and social groups, it is useful to distinguish between supply- and demand-side considerations. On the supply side, the availability of capable elites and the capacity for collective political mobilization are the key factors determining a group's political potential. Elites with the necessary political skills, formal education, and financial resources have an advantage in emerging as attractive candidates for political office (Ricart-Huguet 2018; Arriola 2013a). Ambition for state power is likely to be realized where elites command a loyal following that can be mobilized to threaten, bargain and, if necessary, fight its way to representation (Roessler and Ohls 2018). On the demand side, incumbent gatekeepers decide whom to promote to the highest ranks of state power. As we have seen, central state power is immensely valuable in terms of controlling revenues and regulated markets in land, capital, and output. Incumbent rulers are generally hesitant to share the spoils of political power. They deviate from this pattern in two main ways. First, powersharing will become a necessity if continued monopoly rule in the face of powerful outside challengers threatens political survival. Second, self-interested incumbents will upgrade potential coalition partners who credibly promise to enlarge the pie.

Both supply and demand factors privileged colonial cash crop areas over their mineral or resource-poor counterparts. The opportunities for profit and accumulation led to the early rise of an African commercial elite (Arriola 2013b). The locally 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). Colonial supply of education tended to follow initial investments in physical infrastructure. Even where education was outsourced to Christian missions, the cross followed the flag and the crops (Jedwab, Selhausen, and Moradi 2018). The first universities clustered in mining cities and trading hubs. However, mining wages were low and many African students came from the prosperous cash crop zones. European buying cartels, restrictions on land, crops and labor, as well as misguided campaigns for agricultural intensification spurred early political mobilization in cash crop areas. The Ghanaian cocoa holdups, the Kenyan Young Kikuyu Association, the Ivorian Syndicat Agricole Africain, and the Tanzanian cooperative movement were early arenas of African collective action and anti-colonial resistance (Bates 1987; Tignor 2015; Eckert 2007; Widner 1993). In short, cash crop areas had a head start in terms of both elite formation and mobilizational capacity.

On the demand side, incumbent rulers could hardly ignore cash crop elites. Attempts to keep them out or to actively undermine their local power tended to backfire. The fate of the first Ghanaian president Kwame Nkrumah who was deposed in a coup in 1966 amply illustrates this pattern (Boone 1995). Julius Nyerere's Tanzanian government was more successful in bringing cash crop areas under tight state control. A regime of forced cultivation and villagization produced disastrous economic results (Coulson 1981; Havnevik 1993). Even Nyerere's cabinets contained a number of late colonial cash crop elites (Mtei 2009). 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 gatekeeper and cash crop coalitions occurred, the bargaining space for peaceful agreement was

large.

The supply side factor of early elite formation tends to persist over time. Incumbent elites invest in their reproduction and nurture successors with similar regional or ethnic credentials (Ricart-Huguet 2018). They may well sever the link to their cash cropping roots and fully focus on capital-city careers. Mobilizational potential, in contrast, may wax and wane with the economic value of local resource production. Sufficient patronage resources are needed to effectively mobilize local clients. On the demand side, cash cropping coalition partners become easier to ignore if their mobilizational capacity and revenue generating potential are low. In the empirical sections below, we show that ethnic regions endowed with colonial cash crops are more likely to be represented in African governments throughout the post-independence era. This effect is, however, neither static nor deterministic. Exogenous changes in global cash crop prices predict temporal variation in cash crop elites' representation in ministerial cabinets. No such effects are found for mineral or food producing homelands.

Data

We use ethnic group-level data on political representation and subnational data on colonial export production to empirically assess our theoretical claims. To measure local levels of colonial export commodities, we rely on multiple sources of data. One is from a team led by the prominent geographer of Africa, William Hance. Hance, Kotschar, and Peterec (1961) map out the source location of more than 95 percent of exports in 1957 across 38 states in sub-Saharan Africa.[1] Each primary commodity production point represents a value of $289,270, standardized in 1957 U.S. dollars. The dataset covers 9 groups of cash crops, 20 minerals and metals, and forest, animal and manufactured products, and identifies 9'517 geocoded production points. Figure 1 plots the cash crop and mining points from Hance's dataset. Independently, we

[1] It excludes data on the Union of South Africa (including present-day Namibia), Madagascar and other island colonies.

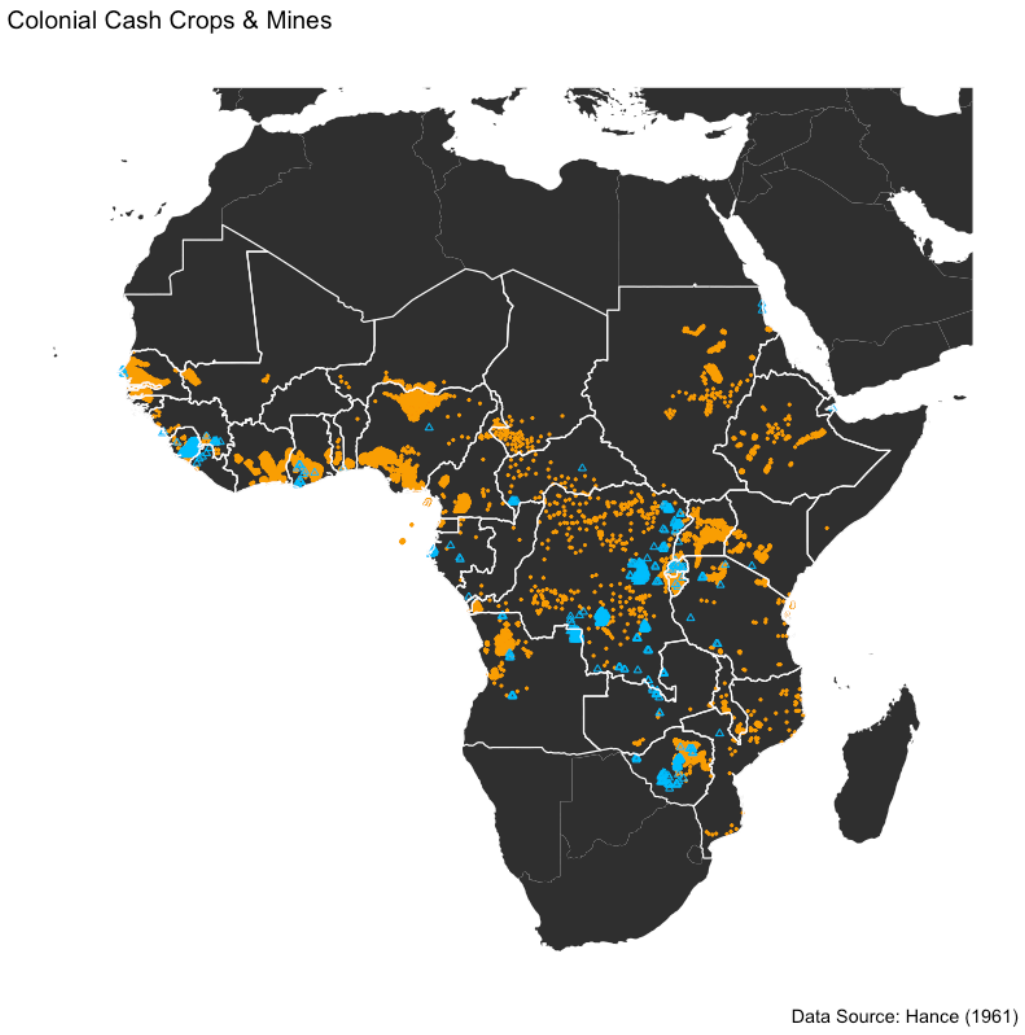

Figure 1: Production Locations of Colonial Cash Crop and Mineral Exports (Source: Hance, Kotschar, and Peterec (1961))

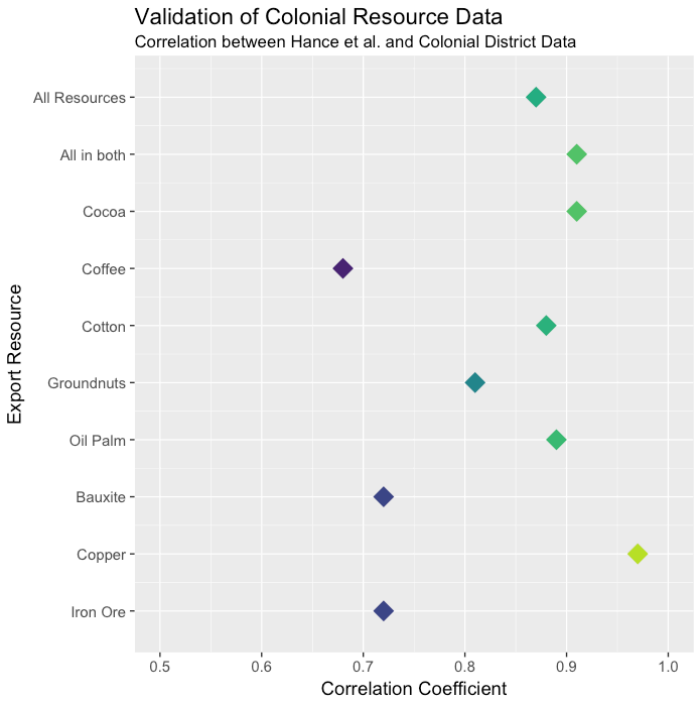

Figure 2: Validating Hance's data at the colonial district level

undertook a similar data collection exercise as the Hance team. Drawing on colonial reports, maps and other records documenting the location, volume and value of primary commodity production across 30 states (28 colonies and the states of Liberia and Ethiopia), the dataset provides information on the subnational distribution (organized administratively) of the most important commodity exports produced by the colony (i.e., those that make up at least 10 percent of total exports at the end of colonialism) standardized in 1960 US$. (See Roessler et al. (2019) for dataset documentation and primary sources used.) We are thus able to validate the Hance et al.(1961) dataset at the level of subnational districts. Figure 2 shows the resulting correlation coefficients.

The main data source is the "ethnicity of ministers" database compiled by Francois, Rainer, and Trebbi (2015, henceforth FRT). Their data codes individual cabinet ministers' ethnic affiliation for 15 African countries. The countries covered are

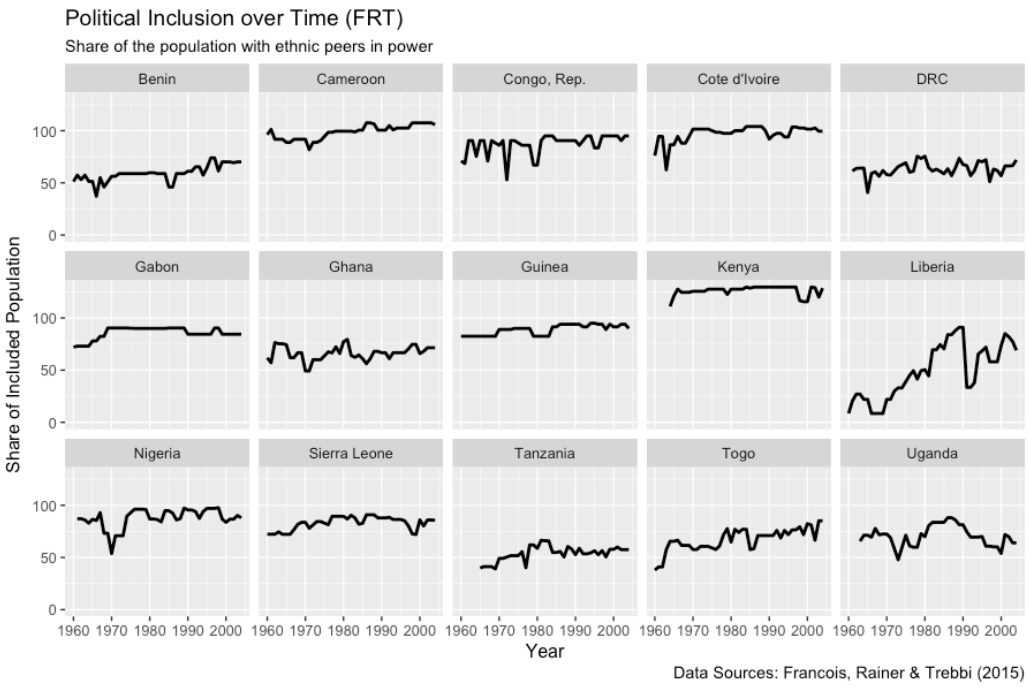

Figure 3: Political Inclusion 1960–2004 (Source: Francois, Rainer, and Trebbi (2015))

Benin, Cameroon, Côte d'Ivoire, Democratic Republic of Congo, Gabon, Ghana, Guinea, Liberia, Nigeria, Republic of Congo, Sierra Leone, Tanzania, Togo, Kenya, and Uganda. For each country, at least 90 percent of all ministers are coded. The data covers the years 1960–2004. Francois, Rainer, and Trebbi (2015) mainly rely on the ethnic group lists by Fearon (2003) and Alesina et al. (2003) to decide on the universe of relevant groups per country. In some cases, they deviate from these previous group lists and choose more fine-grained ethnolinguistic categories. 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. Figure 3 plots the yearly shares of the national population that is represented by at least one co-ethnic minister. Representation shares vary between countries and over time.[2]

An alternative source that we use in robustness checks is the Ethnic Power Relations (EPR) dataset coded by Vogt et al. (2015). The EPR data has broader geographic and temporal coverage than the FRT data. They code access to central state power for the global universe of politically relevant ethnic groups. A group is deemed politically relevant if one of the following two conditions is satisified: (1) A political organization such as a party or armed group claims to represent the ethnic group or (2) the group is subject to state-led discrimination. A group's political power status is coded as categorical variable ranging from "discriminated" to ethnic "monopoly" rule (Cederman, Wimmer, and Min 2010). As such, the information is less fine-grained than the FRT minister data. Temporal changes in EPR-coded power status are typically associated with big political events such as coups d'Etat, successful rebellions, or elections. This limits the EPR data's usefulness for analyses that seek to exploit more gradual temporal variation in political power distributions. In many African countries, EPR codes broad ethnic coalitions as politically relevant. Two prime examples include "Notherners (Mande and Voltaic/Gur)" in Côte d'Ivoire or "Kalenjin-Masai-Turkana-Samburu" in Kenya. The smaller number of groups per country implies less cross-sectional variation to exploit. In addition, the political mobilization of broad

[2]The implausibly high representation shares for Kenya result from imprecisely measured population shares in Francois, Rainer, and Trebbi (2015). Getting population shares right is more important for their own analysis than for the present purpose where group size just serves as a control variable.

ethnic coalitions may be endogenous to some of the political processes we study in this paper. On a more positive note, the EPR data captures more tangible forms of political representation than token cooptation of one or two elites in ministerial cabinets. More importantly, the accompanying GeoEPR data provides shapefiles that map out each group's main settlement areas (Wucherpfennig et al. 2011). This allows to straightforwardly match the geographic resource data to politically relevant ethnic groups.[3]

Unfortunately, the FRT data does not provide any spatial information on ethnic home regions. However, most of the FRT groups are clearly linguistic in nature. We make use of this feature and match all but four of the 265 African ethnic groups in FRT's sample to the Ethnologue language encyclopedia (Lewis 2009). Ethnologue lists all 7097 known and non-extinct languages of the world and provides information on their hierarchical relationships and common origins. Where the FRT data codes a larger language group such as the Nigerian Yoruba or Tiv speakers, we assign all sub-languages of the broader language cluster to the respective FRT group. The World Language Mapping System (WLMS 2017) provides geographic point and polygon data that locate all Ethnologue languages in space. We use the spatial union of all WLMS polygons assigned to the respective language cluster to define ethnic homelands for all 261 successfully matched FRT groups. In a final step, we aggregate the colonial resource point data to the FRT and GeoEPR polygons. Figure 4 shows the resulting ethnic map for the FRT sample.

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

[3]Appendix Figures A2 and A3 provide descriptive summaries of country-level EPR inclusion rates over time and mean group-level inclusion over the entire post-independence period.

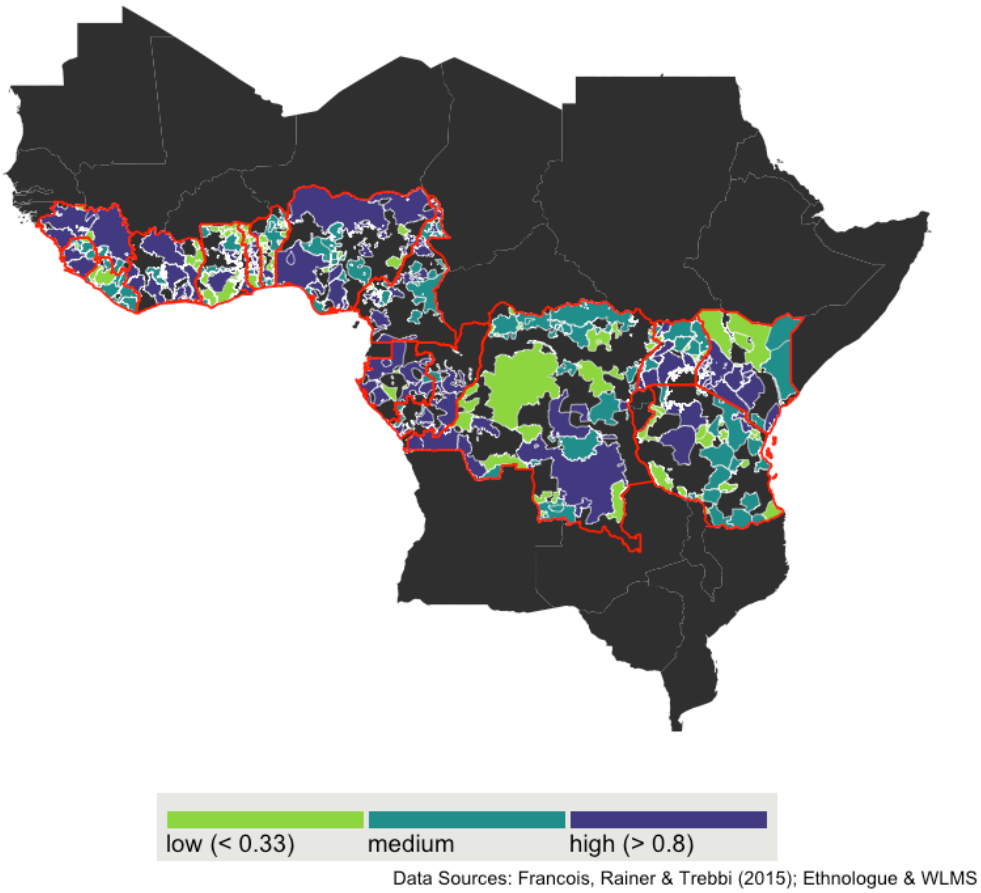

Figure 4: Mapping Cabinet Data to Language Polygons.

Color codes indicate the share of years between 1960 and 2004 an ethnic group was represented in the national cabinet (Sources: Francois, Rainer, and Trebbi (2015) and WLMS (2017)).

minister (*Represented (Y/N)*). In addition we calculate the mean of each group's minister share across all post-colonial cabinet years (*Government Share*). These two variables serve as main dependent variables in the analyses below. We use cabinet shares instead of raw minister counts to net out significant temporal and cross-country variation in cabinet size (Arriola 2009).

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 the two political representation outcomes mentioned above. The main coefficient of interest in the model is β. It captures the effect of colonial cash crop endowments. We choose two different operationalizations for the cash crop variable. The first is a dummy indicating if ethnic group i's settlement area contains at least one point of cocoa, coffee, cotton, groundnut, or oil palm production. The second operationalization is continuous and codes per capita values of cash crop production within each group polygon. We express cash crop values in 1960 USD[4] and use a 1960 population grid from Klein–Goldewijk, Beusen, and Janssen (2010) to standardize production values by ethnic group size.[5] α_c is a vector of country fixed effects that controls for unobserved, time-invariant differences between post-colonial states. We only compare ethnic groups located within the same country and thus effectively account for country-level variables such as metropolitan identity or landlocked location. X_{ic} is a vector of ethnic group-level baseline 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

[4]Historical resource price data comes from (Jacks 2013)

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

and capital as well as two variables from Murdock's (1967) Ethnographic Atlas: Pre-colonial political centralization and historic reliance on agriculture.[6] 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 smoothly decaying spatial correlation within the radius of a circle that roughly corresponds to the mean country size in our sample.[7]

The baseline specification just outlined yields unbiased estimates if our colonial cash crop proxy is conditionally exogenous to political power. If particularly powerful ethnic groups managed to get cash crop production going in the colonial age, or some third, unobserved group-level variables affect both cash crop production and the odds of post-colonial representation, coefficients will be biased. While X_{ic} contains the most obvious geographic and historical confounds, unobserved differences in mobilization potential may still affect our estimates. We address these potential threats to inference by instrumenting colonial cash crops with agro-climatic soil suitability scores from the FAO's GAEZ database (FAO/IIASA 2011). The instrumental variable strategy needs to satisfy three conditions to yield valid causal estimates. First, the instrument has to be relevant and predict actual cash crop production with sufficient precision. Second, treatment assignment (i.e. the geographic distribution of cash crop suitability) has to be exogenous to the outcome variable. Third, the exclusion restriction requires that the instrument only affects the outcome through the endogenous treatment or actually measured covariates included in the model.

The first condition can be tested by running the following first-stage regression:

$$\text{Colonial Cash Crops}_{ic} = \alpha_c + \delta\,\text{Cash Crop Suitability} + \gamma\,X_{ic} + \epsilon_{ic}$$

A first stage F statistic greater than the, admittedly arbitrary, threshold value of 10

[6] Elevation and slope grids come from FAO/IIASA (2011) and are aggregated by using the 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 Nathan Nunn (2008). We transform Murdock polygons to a 5km × 5km raster and then aggregate EA variables to the WLMS and GeoEPR polygons used in this paper.

[7] Table A6 replicates our baseline models with country-clustered standard errors. Significance levels remain the same.

indicates sufficient instrument strength. We show below that this is the case. The second condition is also met. Soil and climatic characteristics are clearly exogenous to any political and economic activities. The exclusion restriction is threatened by two alternative causal pathways. First, particularly fertile soils may have historically led to higher population density, complex forms of social and political organization, and, consequently, greater mobilization potential. Second, cash crop suitability, especially for tree crops clusters in humid forest zones, which are, at least in West Africa, relatively close to the coastal trading hubs. These alternative pathways can, fortunately, be measured and included in the set of control variables. As for the first alternative pathway, all models control for *general* agricultrual suitability. The data comes from Ramankutty et al. (2002) and is based on a complex model with various soil and climate-related inputs. It combines information on precipitation, temperatures, sunshine hours, soil carbon density and soil pH values. We additionally control for mean elevation and terrain slope that may also affect agricultural potential. To account for the second alternative pathway, we control for the logged distances between each group polygon's centroid and the closest seacoast or the respective national capital. The historic agriculture and political centralization variables control for early agricultural intensification or political organization that may have been related to native crops such as oil palm, coffee, or cotton. Conditional on these covariates, the exclusion restriction is likely to be met.

Results

Table 1 presents our baseline results from simple OLS regressions. The first two columns use the share of years included as the dependent variable. The coefficient on the colonial cash crop dummy is positive and highly significant. Multiplying the coefficient with the 45 years between 1960 and 2004 indicates that, on average and all else equal, groups with colonial cash crops were represented 7.02 years longer in post-colonial cabinets than their non-cash cropping counterparts. 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%)

Table 1: 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

is associated with a representation gain of one additional year. Columns 3 and 4 use the logged government share of ethnic groups as outcome.[8] Both the binary and the continuous cash crop proxies have positive and highly significant coefficients. The substantive effect of the dummy variable in the log-level specification of column 3 can be expressed in percentage terms as $100 \times (exp(\beta) - 1)$. Cash crop groups thus had, on average, 39.93 percent more ministers than non-cash crop groups. The fourth column suggests that a 100% increase in 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.[9]

Table 2 repeats the same set of analyses for colonial mineral export production. The coefficients on the colonial mining dummy are substantively small, negatively signed, and far from significant. The per capita mining value variable in columns 2 and 4 yields relatively precisely estimated null effects. Table 3 replaces colonial cash crop or mineral production with estimated per capita values of food crop production.

[8] The distribution of raw government shares is extremely right-skewed. We therefore take the log of cabinet shares and add a small constant to keep zero-valued observations in the sample.

[9] Figure A1 in the Appendix plots coefficient estimates and confidence intervals of 45 yearly replications of the first model in Table 1

Table 2: 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

To that end, we use two geospatial 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 for the purpose at hand, maize and sorghum are the two most important food crops in the 15 countries in our sample.[10] The second dataset is the M3 data by Monfreda, Ramankutty, and Foley (2008) which contains global maps of the harvested area, yield and production volumes of 175 crops around the year 2000. In contrast to the FAO GAEZ data that only uses soil and climatic characteristics as inputs, the M3 data combines similar information with satellite-derived data on actual croplands and subnational statistics on production volumes to assign global agricultural output to a 5×5 arc minute grid. We use the maize, sorghum, and wheat production grids to calculate,

[10] I 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 3: 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

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 3 shows that groups with high staple crop production or potential are significantly less likely to be politically included. The effects are substantively even larger than for colonial cash crop production. The results from Table 1 seem clearly specific to cash crops and do not just reflect high agricultural productivity.

Table 4 contains results from the instrumental variable models estimated via two-stage least squares (2SLS). 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 positively signed and significant at conventional levels. The estimated causal effects are 1.4 times to twice as large as in Table 1. However, due to the two-stage setup, we lose precision and the 95% confidence intervals of the estimates always contain the OLS point estimate from Table 1. In other words, we fail to reject the hypothesis that the *causal* effect of colonial cash crop production is significantly different from the

Table 4: 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

naïve OLS effects.[11] Colonial cash crop production at the ethnic group level causally affects the likelihood of representation in post-colonial ruling coalitions.

Causal Mechanisms & Alternative Explanations

As discussed in the theory section, 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 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 (2018) points

[11]Table A7 in the Appendix reports the 2SLS-IV analysis with country-clustered standard errors. Standard errors and significance levels hardly change. Table A8 reports reduced form estimates and shows that raw cash crop suitability or potential yields multiplied by 1900 world market prices significantly increase representation in post-colonial governments.

Table 5: 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

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 two cross-sections of cabinet ministers' birthplaces (1960–1970 and 1990–2010) 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 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.[12] 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 5 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. This suggests that early cash crop elites' commercial and political rather than mere educational clout is likely to explain our findings.

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. 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 6. 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%

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

Table 6: 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

smaller than in the baseline specifications from Table 1. 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.

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 7 reports our findings. The coefficients on the colonial cash crop dummy are positively signed but 60% smaller than in Column 1 of Table 1. 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

Table 7: 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

at the 90% confidence level, regardless of whether we cluster errory by country or use Conley's (1999) method. The coefficient size is practically identical to what we find in Table 1. Similar results from two independently collected data sources on political representation should increase our confidence that there is an effect.[13]

Analyzing Changes over Time

The cross-sectional results just presented strongly support our theoretical claims. It remains to be tested if temporal changes in the market value of colonial cash crops translate into variation in political representation. The bargaining mechanism proposed above suggests that cash crop groups' mobilizational potential and incumbent rulers' incentives to include cash crop elites in ministerial cabinets vary with the economic value of the underlying resources. Tax potential and the need for local intermediaries to ensure smooth production and surplus extraction are greatest when cash crop prices are high. Only when returns on local land, labor, and capital are

[13]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.

high will cash crop elites have sufficient patronage resources to ensure the continued loyalty of their, more often than not, ethnically defined constituencies.

Research Design

We test these claims by estimating the following time-series cross-sectional model:

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

Y_{ict} is one of two political representation outcomes. The first is a dummy coded one for all group-years with at least one minister. The second is 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. Cross-group differences in geographic or population size, coastal location, levels of colonial investments or resource production, and pre-colonial or colonial political mobilization are thus accounted for. 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. 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.

The main predictor variable is an interaction term between ethnic group-level cash crops and a logged index of crop-specific world market prices. The cash crop price data comes from Jacks (2013). We restrict the analysis to the five most important colonial cash crops that are unambiguously coded on the historical map by Hance, Kotschar, and Peterec (1961). For each ethnic group, we calculate the interaction by taking an annual weighted mean of the five cash crop prices. In the baseline specifications, we use the individual crops' shares in the respective group's total colonial export value as weights. In other words, we weight cash crop prices by the eco-

Table 8: 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)
Country FE	Yes	Yes	Yes	Yes
Baseline Controls	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

nomic importance of each crop in a group's total export production, regardless of the group's overall contribution to country-level exports. This operationalization translates Bazzi and Blattman's (2014) country-level approach to the group level and is, theoretically speaking, most relevant for the supply-side mechanisms of elite formation and mobilization. In Appendix Table A9, we replicate the analysis with weights based on per capita and total cash crop values, which are arguably more relevant for the demand-side factor of national revenue potential. The results remain essentially the same. Due to the fixed effects setup, no constitutive terms of cash crop weights or raw price indices are needed. To check whether any results are truly 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. Figure 5 plots the price indices for all three resource types.

Results

Table 8 presents a first set of cash crop results. The first two columns are based on linear probability models with a binary representation dummy as dependent variable. Columns 3 and 4 use the logged minister count as outcome. 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 eight control variables from the cross-sectional

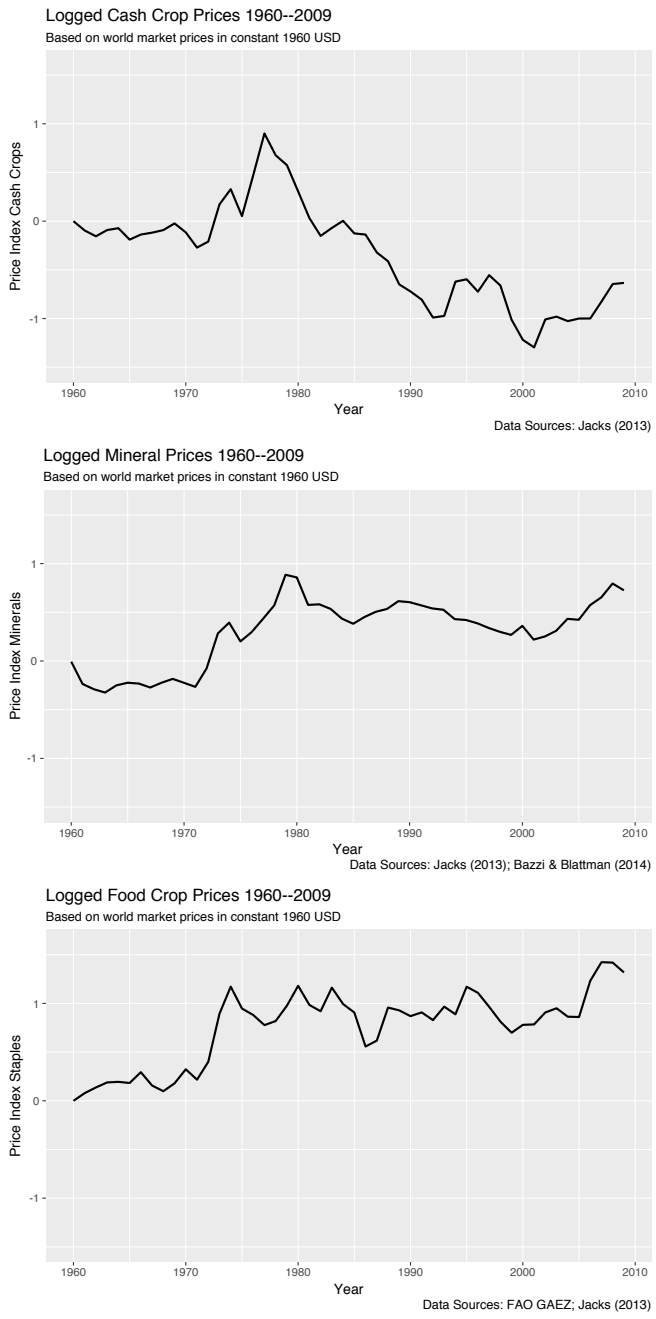

Figure 5: Logged Price Indices of Cash Crops, Minerals & Food Crops, 1960–2004

setup and 44 year dummies. This allows for time-varying effects of the baseline controls. All four coefficient estimates are positive and significant at the 5% level. Substantively speaking, a doubling of cash crop prices is associated with a roughly nine percentage points higher probability of political representation. This amounts to a 17% increase relative to the mean of the dependent variable at 0.56. 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 8 have a plausibly causal interpretation if global cash crop prices are exogenous to economic and political developments within the countries and groups 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 value are Ghana and Côte d'Ivoire (both cocoa). In Appendix Table A10 we rerun the analysis but drop all Ghanaian and Ivorian observations from the sample. If anything, coefficient estimates get larger.

Table 9 summarizes results based on colonial and more recent mining data. The predictor variable in the first row is the mineral equivalent to the cash crop variable from Table 8. 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 group-level political representation. However, global demand for minerals changes over time and Africa has seen a couple of veritable post-independence min-

Table 9: 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)
Country FE	Yes	Yes	Yes	Yes
Baseline Controls	Yes	Yes	Yes	Yes
Controls × Year Dummies	No	No	No	No
Observations	10,966	10,966	10,967	10,967

No *tes:* 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

ing 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 10 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 the same as in previous specifications.

Table 10: 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)
Country FE	Yes	Yes	Yes	Yes
Baseline Controls	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

Implications for Rural Living Standards

The cash crop effects on political representation raise an important follow-up question: Do cash crop producing constituencies benefit from having ethnic peers in power? The literature is divided. On the one hand, there is robust empirical evidence for ethnic favoritism in public goods provision (Franck and Rainer 2012; Burgess et al. 2015; Kramon and Posner 2016). On the other, Bates (1981) and Kasara (2007) argue that African governments tend to distribute away from rural cash crop producers. According to Bates (1981), rural constituencies have a hard time to mobilize. As a result, urban unrest is the far greater danger for African rulers. They exploit the supposed political weakness of cash cropping regions to heavily tax their production and subsidize urban food and fuel consumption. Incumbent presidents may well coopt cash crop elites as useful partners in crime. However, the bulk of the cash cropping population is expected to lose out. Kasara (2007) provides pioneering quantitative evidence that politically represented cash crop groups face higher tax burdens on their output. Does the representation of cash crop elites merely serve as a tool to exploit their rural constituencies? Or is there evidence for *real* ethnic representation that

Table 11: 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

yields tangible material benefits? The two mechanisms are not incompatible. The crucial question is whether extractive governments leave any surplus in producing regions or at least match taxation with *local* public goods. Local producers are likely to quit cash cropping in the face of excessive taxation. As a consequence, extreme interpretations of a cash crop-financed urban bias seem implausible.

The implications for rural living standards can be tested. We use 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 individual households' incomes 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 data set 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.[14] 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, which is, in turn, nested in an African country. The group-specific cash crop price index serves as main independent variable. The goal is to test whether rising cash crop prices translate into higher chances that rural infants in producing regions survive. If all surplus is distributed away from cash crop regions, we should 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 imply that we restrict comparisons to infants who were born in the same year and country

[14] As an alternative strategy, one could match infants to ethnic groups by the mother's stated ethnic identity. However, our goal is to measure rural living standards in producing regions rather than living standards of out-migrants with roots in cash crop regions.

and whose mother was interviewed in the same DHS survey round. This accounts for temporal shocks at the country level and potential changes in survey methodology. In a second step, we interact group-specific 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. This ensures equal weights for each FRT group and is in line with our interest in group-level rather than individual effects.

Table 11 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 remains at the site of production. The interactions with the binary and continuous representation variables yield small and insignificant coefficients. Kasara (2007) may be right in claiming that politically represented cash crop regions face higher tax burdens. However, representation does not alter the effect of rising prices on rural constituencies' infant mortality rates. The most likely explanation is that taxation is matched with local public goods provision.[15]

Conclusion

Figure 6 graphically summarizes our main findings. In short, colonial cash crops and their changing market values have consistently positive and significant effects on ethnic groups' representation in ministerial cabinets. Effects of mineral resources and staple crops are never positive or significant. Instrumental variable results and the exogenous nature of world market prices suggest that the cash crop effects are

[15] Appendix Tables A11 and A12 repeat the analysis for the entire dataset and the urban subsample. Rising cash crop prices do not reduce infant mortality in ethnic cash crop regions' urban centers. The results for the complete sample are very similar to what we find in the rural subsample.

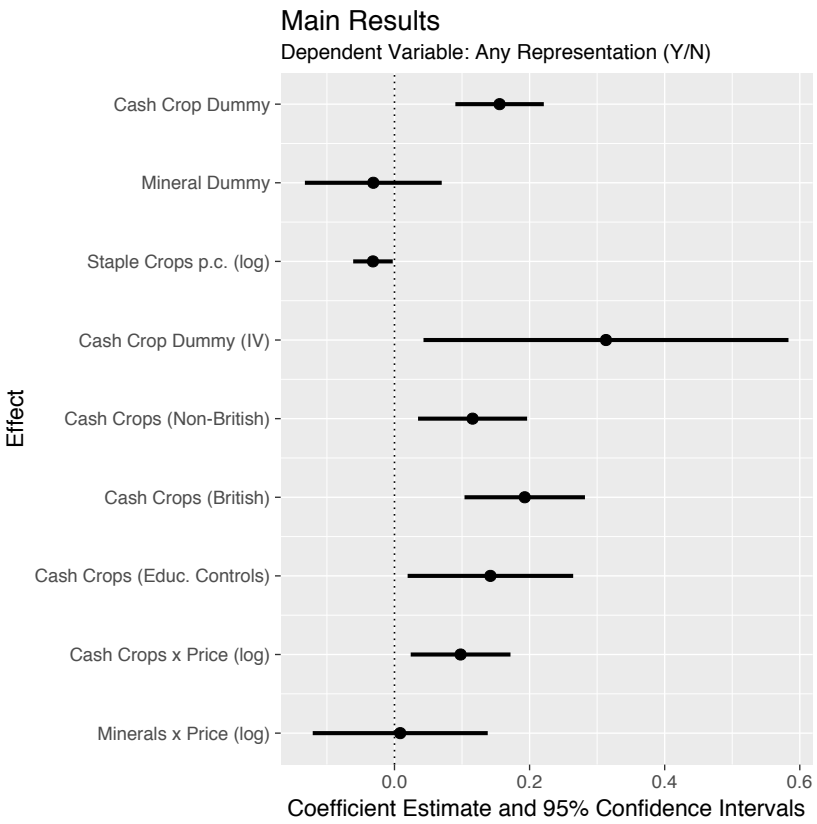

Figure 6: Main Results

causal. Neither agricultural productivity nor resource wealth *per se* cause political inclusion. The cash crop-specific effects are best explained by a bargaining process between cash crop elites and incumbent rulers. The specific institutional setup of the colonial age gave cash cropping groups an early advantage in terms of elite formation and political mobilization.

Incumbents' desire to tax cash crop exports without stifling production makes them likely to include elites from production regions in their ruling coalitions. Local intermediaries ensure political support, acquiescence to indirect taxation, and perhaps, as Baldwin (2015) has argued, efficient provision of local public goods. Capital-intensive mines can be controlled and taxed directly without the assistance of local intermediaries. Locally traded staple crops provide less revenue potential. In addition, states without effective local tax bureaucracies have a hard time to extract food crop-based revenues. Production and trading need to be monitored and taxed at the local level. These general features of different resource types likely explain why we find no systematic differences between British and non-British colonies. Metropolitan ideologies and their institutional legacies matter less where colonial and post-colonial rulers face similar challenges and opportunities in terms of revenue collection and political survival. As such, representation in African ruling coalitions is a more complex phenomenon than the efficient recruitment of qualified candidates for political office. Colonial investments in education may matter but are unlikely to be the main storyline. Elite bargains about government representation are a genuinely political rather than mere economic phenomenon. Somewhat ironically, we use data on economic resources and market prices to drive home this point.

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Additional Plots & Tables

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

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

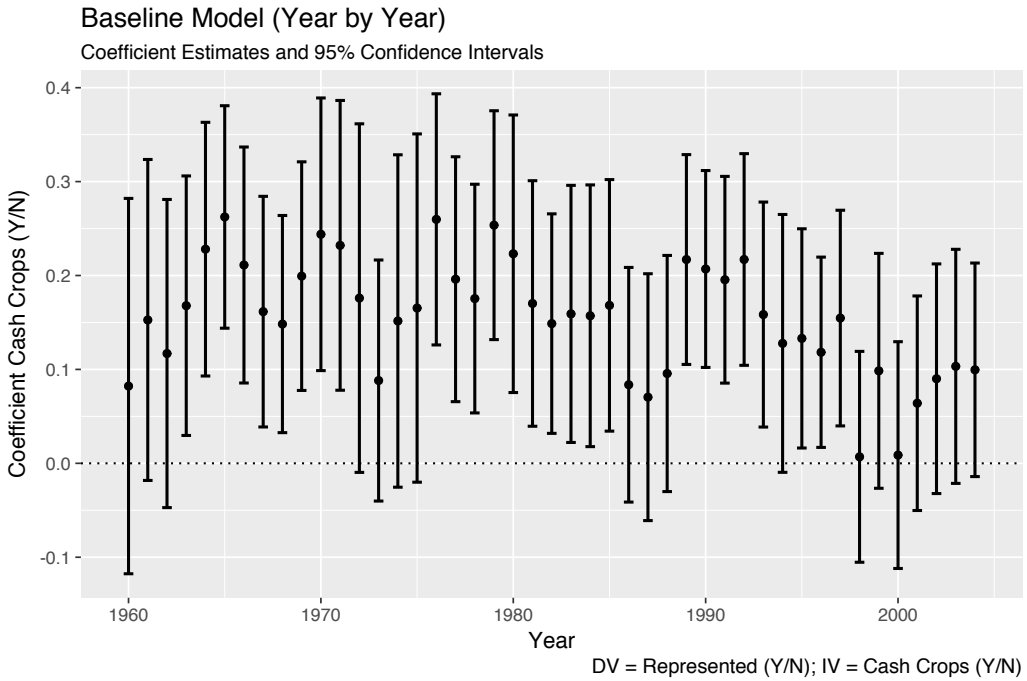

Figure A1: Year-by-Year Estimates of the Baseline Model in Column 1 of Table 1

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

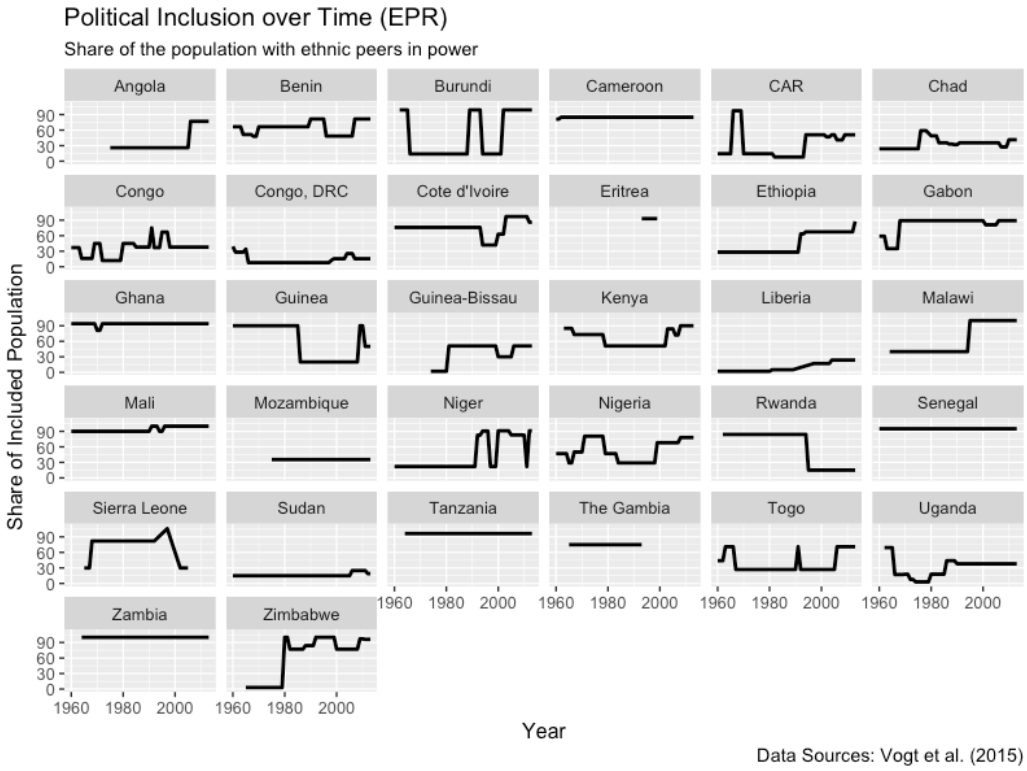

Figure A2: Shares of Politically Represented Population over Time (EPR Data, 1960–2013)

Table A9: 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)
Country FE	Yes	Yes	Yes	Yes
Baseline Controls	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

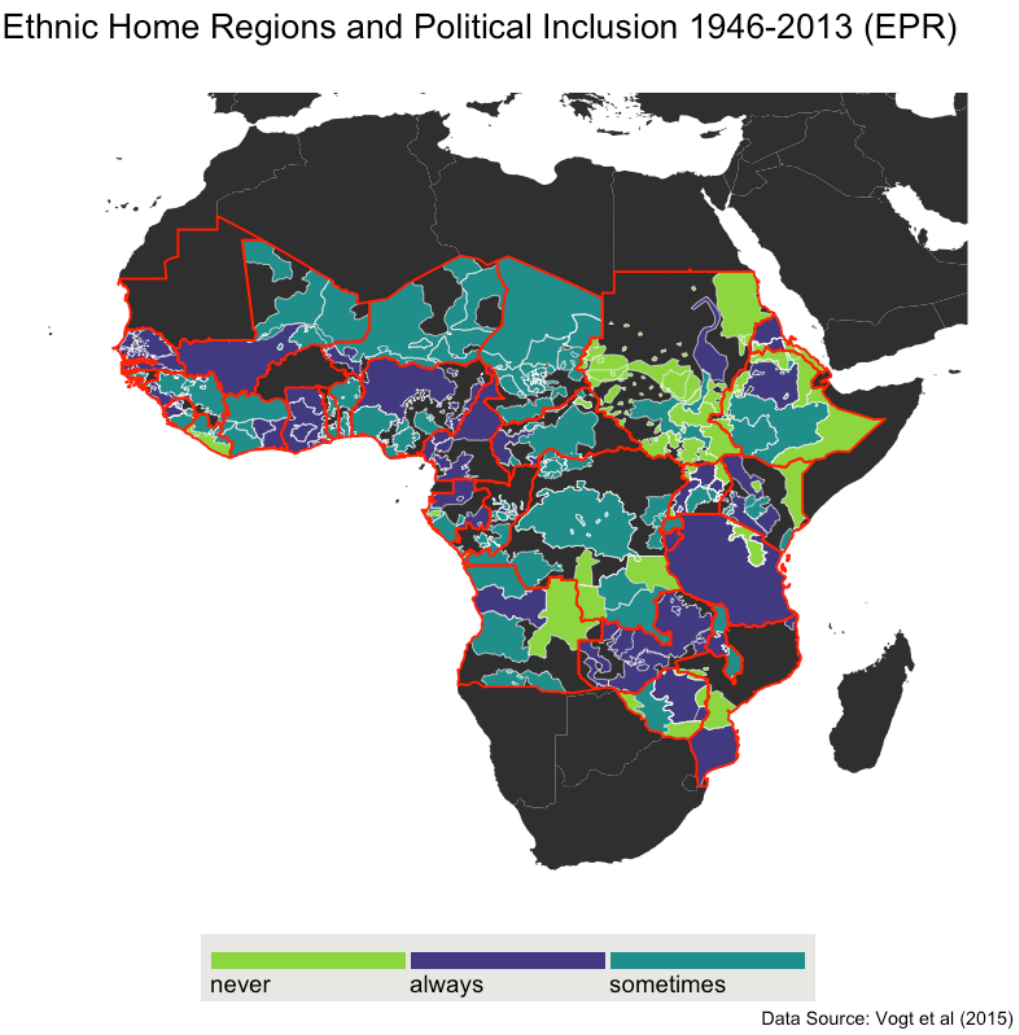

Figure A3: Share of Years with Political Inclusion, 1960–2013 (EPR Data & GeoEPR Polygons)

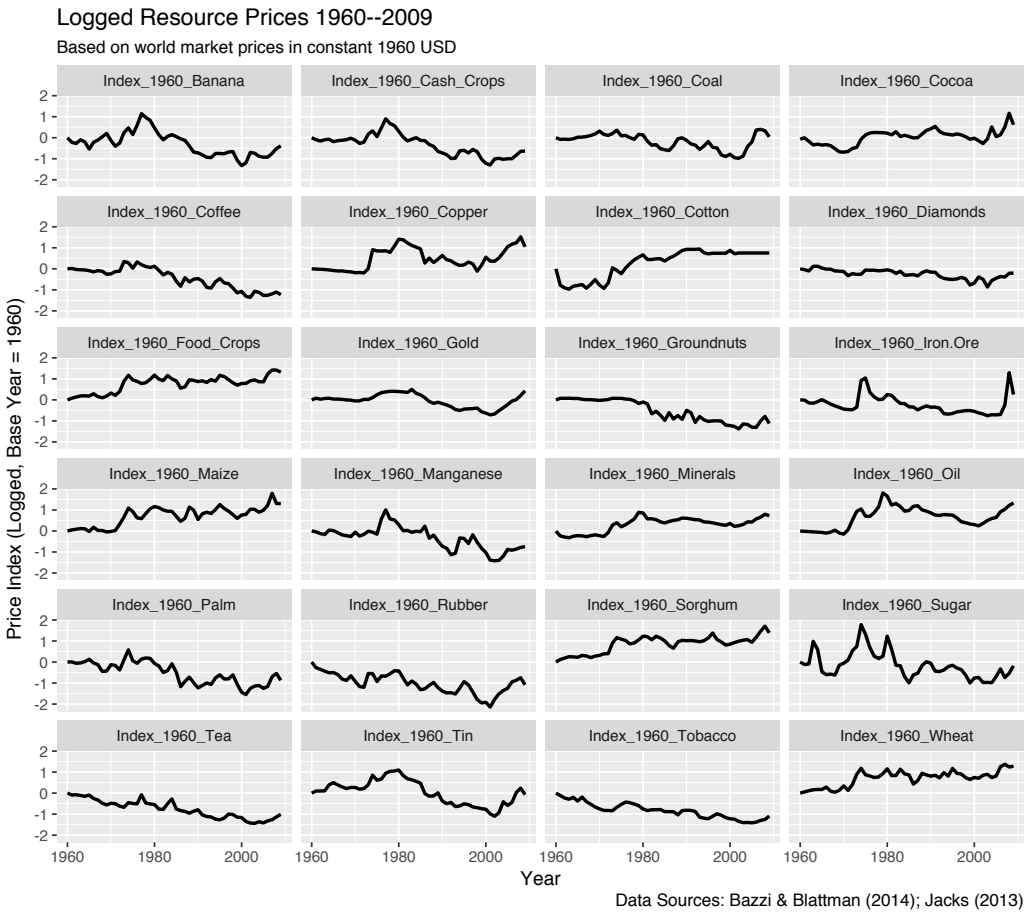

Figure A4: Logged Price Indices of Individual Crops & Minerals, 1960–2009

Table A10: 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)
Country FE	Yes	Yes	Yes	Yes
Baseline Controls	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

Table A11: 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 A12: 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