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Africa's Mineral Transition in Long-Term Perspective

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Africa's Mineral Transition in Long-Term Perspective

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Abstract

We create a novel commodity trade database to trace Africa's mineral transition across 1850-2020. How did the growth of mineral exports affect (pre-)colonial specialisation in tropical cash-crops, the mainstay of millions of African smallholders? We show that the mining sector benefitted from relatively favourable terms of trade, but primarily after 1998. Contrary to standard 'resource curse' arguments, export agriculture did *not* decline because of mineral export-induced crowding-out, but rather due to political violence and fiscal predation. Yet, the probability of *recovery of export agriculture after collapse* appears to be strongly mediated by the presence or absence of minerals.

Keywords: Africa; commodity trade; mineral transition; cash crops; natural resources; development.

JEL classification: F14, N17, N57, N77, Q02, Q32, Q33.

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Introduction

Over the past two centuries, Sub-Saharan Africa has undergone two major trade transitions. The first, known as the “commercial transition”, unfolded over the long 19th century. The commercial transition entailed the replacement of ocean-based slave trades by tropical agricultural exports, and the concomitant expansion of slave-plantation economies within Africa (Hopkins 1973; Law 1995; Tomich and Lovejoy 2022) and its adjacent islands (Cooper 1977; Sheriff 1987; Allen 2015). A second transition emerged over the course of the 20th and early 21st centuries as crude oil and other mineral commodities began to replace tropical crops as the dominant mode of economic specialization. In analogy to the “commercial transition”, we refer to it as Africa’s “mineral transition”.¹

During the commercial transition the production and export of an expanding range of agricultural commodities and forest products rose to historically unprecedented levels (Tosh 1980; Austin 2014; Jedwab and Moradi 2016; Frankema et al. 2018; Roessler et al. 2022; Tadei et al. 2025).² With the notable exception of South Africa, by 1900 virtually all of Sub-Saharan African exports consisted of tropical crops such as sugar, palm oil/kernels, groundnuts, and rubber. African rulers supported the expansion of these crops to compensate for the loss of slave export revenues, and often employed enslaved Africans in their production, processing and transportation. The colonial regimes established in the closing decades of the 19th century also embraced what they, by then, considered to be ‘legitimate’ commerce, recognizing that financing the colonial state independent from metropolitan subsidies critically depended on the direct and indirect taxation of these trades (Frankema 2011; Gardner 2012; Cogneau et al. 2021). Driven by rising global demand from industrializing economies and revolutionary advances in transport technology (Jedwab and Moradi 2016; Pascali 2017), the per capita export revenues of Sub-Saharan Africa soared to levels matching those of Southeast Asia by the eve of World War II (Frankema and Westland 2026).

In Africa, the mineral transition began in the early colonial era, shortly after 1900, and advanced rapidly after most countries in the region achieved political independence in the early 1960s. Although the shift toward minerals remains ongoing and tropical crop exports have not, unlike the trade in enslaved people, disappeared altogether, it has profoundly transformed African societies and ecologies and reshaped economic structures, fiscal systems, legal

¹ While we will use the singular form throughout the paper, there are good reasons to think about ‘mineral transitions’ in the plural. An earlier mineral transition occurred in South Africa which intertwined with politics of *Apartheid* (Feinstein 2005). In South Africa, diamond and gold deposits were discovered in respectively the 1860s and 1880s, and their export dwarfed those of the other Sub-Saharan economies before 1914. Lumping both would obscure the early phase of the mineral transition in the tropical parts of Africa south of the Sahara. Only in the 1950s, did tropical Africa achieve parity with South Africa’s mineral export value (see Appendix Figure 1). North Africa, on the other hand, traded mostly within the Mediterranean basin (Naylor 2010) and had, for many centuries, been a net-importer of slaves from across the Sahara (Wright 2007). North Africa thus never had a commercial transition. Moreover, except for Egyptian cotton, North African – like South African – export crops were reminiscent of more temperate climate zones. Given these important historical and geographic differences, this paper focuses on the mineral transition of Sub-Saharan Africa, excluding South and North Africa.

² Slavery was gradually abolished during the colonial era but often replaced by alternative systems of forced labour. For French West Africa see Klein (1998); for British Africa see Okia (2022).

institutions, social relations, and patterns of land use. Yet, despite its significance, and in contrast to the extensive literature on Africa's commercial transition, the mineral transition has remained vastly understudied in economic history literature.

The historiographical debate on the commercial transition has focussed on how African slave-exporting polities adapted to the collapse of Atlantic markets for enslaved labour, and the extent to which this undermined ruling elites and prompted political and economic adaptations to develop alternative sources of revenue.³ This debate never reached a firm conclusion, as comparative studies revealed diverse ways in which African states mediated the transition (Law 1995; Law et al. 2013). For example, whereas the Kingdom of Dahomey clung to the Atlantic slave trade as long as possible before switching to palm oil, the neighbouring Asante Kingdom abandoned it almost immediately following the British Abolition Act of 1807 (Law 2004; Dalrymple-Smith 2019). And whereas some argued that the decline of the slave trades caused conflict and 'crises of adaption', other historians maintained that ruling elites managed to retain their control over means of enslavement and diverted their trades away from the Atlantic coast to the Sahara and North Africa trade, or increasingly used slave labour to develop domestic industries (Dike 1956; Hopkins 1973; Lovejoy 2011, p.184).

Similar questions are relevant for Africa's mineral transition. How, for example, have the agricultural export sectors that emerged during the commercial transition, in turn, been affected by the expansion of mineral exports in Africa's emerging mining economies? This is a big open question since the overarching patterns of the mineral transition have yet to be identified, and testable hypotheses yet to be developed, to understand its historical significance. The existing literature, largely rooted in development economics, has primarily focused on the effects of mining for macroeconomic growth, income volatility, conflict and violence, and environmental degradation (see Section 2). This literature has seldom examined, let alone systematically analysed, the link between the crop export regimes that emerged in the 19th and early 20th centuries and the mineral export regimes of the post-colonial era. In fact, most of the literature, including the few studies that have adopted a long-term horizon such as Deaton's (1999) seminal study on commodity prices and African growth, have treated agricultural commodities and minerals as examples of the same phenomenon: Africa's persistent primary commodity dependence.

Why are long-run historical perspectives so rare? Investigating the mineral transition in its full scope requires linking colonial and post-colonial trade data for more than 50 present-day African countries and their colonial predecessors. This implies the collection of data from, and integration of, an exceptionally wide and fragmented range of sources. This challenge has been overcome through the creation of the African Commodity Trade Database 2.0 (ACTD 2.0). This database covers 51 present-day African polities and contains over 80,000 manually

³ The debate focussed on West Africa, partly because the size of the Atlantic slave trades was much larger, but also because subsequent tropical crop exports (e.g. palm oil, groundnuts) were initially much larger in Western than in Eastern Africa. A notable exception are the sugar exports from the Mascarenes which were up to the early 19th century largely produced with African slave labour.

entered, HS-classified observations on export volumes and export values by commodity and year, spanning 1790-2020. This is the first study to use the ACTD 2.0.

Our paper makes three contributions to the economic history of Africa. First, we introduce the ACTD 2.0 to establish the overarching patterns of Africa's mineral transition from the mid-19th century to the early 21st century. Our newly compiled trade database enables a comprehensive analysis of the transition from agricultural commodities to minerals and provides essential historical background to studies of African external trade. Second, we decompose Africa's mineral transition by disentangling the underlying price and volume trends. We demonstrate that long-term international prices of crops and minerals have moved in tandem for most of the 20th century, but that they rapidly diverged at two points in time: (i) during the 1970s, when oil prices soared, and again (ii) during the 2000s, when prices of non-oil minerals caught-up while prices of crops remained tied to their long-term floor. The second of these price scissors, as we will highlight, challenges existing theories of primary commodity price behaviour. The increasing global demand for minerals such as gold, tin, cobalt, coltan, lithium and diamonds also spurred the expansion of artisanal and small-scale mining (ASM), partly reversing the 20th century process of capital-intensification in African mining.

Third, based on an in-depth study of 32 cases of agricultural export collapse that we identified in the ACTD 2.0., we add a crucial nuance to standard 'resource curse' interpretations that associated the decline of African commercial agriculture with crowding-out mechanisms of a growing mining sector. Our analysis reveals that, in most cases, the deterioration of crop exports was *not* caused by the surge of mining, nor by negative international price shocks. Rather, political instability, large-scale violence, and excessive taxation (acting through a variety of channels) account for the overwhelming majority of cases in which 'traditional' crop export industries collapsed. We show that crowding-out mechanisms appeared to operate *only after* the collapse of an agricultural export sector, as the probability of a recovery of agricultural exports appears to be much lower in mineral economies (6%) than in economies without a significant mining sector (69%). While the initial decline of crop exports was largely unrelated to the mineral transition, their subsequent recovery prospects were strongly mediated by it.

The paper proceeds as follows. Section 2 discusses several mechanisms of mineral-induced crowding of agricultural exports within a broader literature survey. Section 3 introduces the African Commodity Trade Database. Section 4 surveys the changing composition of Sub-Saharan Africa's agricultural and mineral exports from 1850 to 2020. Section 5 analyses Africa's long-term price and volume trends and related commodity-specific terms of trade. Section 6 investigates the crises and recovery in African agricultural exports in relation to crowding out mechanisms. Section 7 concludes.

2. The Mineral Transition: Curse or Blessing?

The last study that has genuinely analysed African commodity exports over the long 20th century is Angus Deaton's "Commodity Prices and Growth in Africa" (1999). Published more than 25 years ago, Deaton showed that most commodity price shocks were booms, a type of price volatility that spurs rather than retards economic growth. He also showed that the relative prices of primary commodities tended to mildly deteriorate over the long-run. Deaton explains this "stylized fact" of commodity price development with reference to Lewis' labour surplus theory (Lewis 1954). The main idea is that whenever commodity prices shoot up, the available surplus labour in underdeveloped economies across the global South will quickly be attracted to expand production, driving down world market prices to their long-term equilibrium. Deaton's study was published at the eve of a new era in which the relative prices of minerals began to move away from their long-run price floor, while the international prices of both food and tropical cash-crops remained tied to their floor. It makes sense, therefore, to distinguish crops from minerals when extending Deaton's original analysis (see also Deaton and Miller 1996).

A global study by Harding and Venables (2016), focussing on the shorter period 1970-2006, investigates the extent to which non-renewable natural resources crowd out other sectors. They define a resource-exporting economy as one in which exports of non-renewable natural resources exceed 1% of GDP in 2000-2006. According to this definition, their sample comprises 41 resource-intensive exporting countries, 11 of which are in Africa (see Appendix Table 1 for an over view of export to GDP ratio's in Africa). Their main finding is that every additional US\$ in exported resources lowered non-resource exports by c. 0.74\$ and raised imports by c. 0.23\$. Especially, manufacturing exports have experienced crowding out (-0.46\$), while services (-0.17\$) and agricultural and food products (-0,06\$) suffered much less. They attribute these results primarily to a Dutch disease effect: countries facing upward pressure on exchange rates are less attractive to 'footloose' manufacturing industries.

However, the findings of research on Africa's mineral transition are not always easy to reconcile. Katoka and Dostal (2022) have identified a positive link between natural resource exports and economic growth in Sub-Saharan Africa during 1990-2020, an effect largely driven by the stronger economic performance of oil-rich economies (Smith 2015). The dominant view, however, consists of a variety of 'resource curse' arguments (Auty 1993; Ross 1999) which have associated mineral production with high price volatility, procyclical government spending, and Dutch disease effects, as well as higher incidences of corruption, state predation and violent conflict.⁴ Yet, the resource-curse perspective contrasts with studies using fine-grained micro-level data pointing to positive and persistent long-term local development effects of both cash-crop and mineral production sites across Sub-Saharan Africa (Roessler et al. 2022; Mamo et al. 2017). Then again, other studies have recorded adverse development effects of mining on the local level by enhancing local conflict, ethnic strife and corruption (Berman et al. 2017, 2023;

⁴ See reviews by Van der Ploeg (2011), Papyrakis (2017) and Van der Ploeg and Poelhekke (2017).

Knutsen et al. 2017). The socio-environmental consequences of intensified land use and resource extraction such as deforestation, soil erosion, chemical pollution, biodiversity loss and community displacement have recently also received attention (Ondayo et al. 2023; Bofo et al. 2024; Girard et al. 2025).⁵

Three points must be kept in mind when dissecting these seemingly irreconcilable views. First, there is the possibility of a micro-macro paradox: the positive local development effect of a mine, mill or plantation, as nodes of concentrated historical investment, may co-exist with adverse long-term effects of primary commodity production at broader spatial scales, particularly when former export zones have ceased to be as productive as they once were (De Haas and Schalken 2026). The reverse may also hold: while oil production stimulates economic growth, it may erode local agriculture through increased food imports or crowding out of cash-crop exports. Secondly, most of the literature has considered agricultural and mineral commodities as part of a similar, rather than a distinct pattern of primary commodity specialization (cf. Deaton 1999; Blattman et al. 2007; van der Ploeg 2011). Thirdly, studies adopting a long-run perspective are virtually non-existent. Filling this gap is important, because the nature of the linkages between agriculture and mining can change over time.

A fivefold conceptual distinction of crowding-out helps to clarify the channels through which mining may affect export agriculture. (i) *Dutch disease*: local currency strength as a result of mineral exports reduces the international competitiveness of agricultural exports. As farmers receive lower returns per unit exported, they may abandon crop production and/or switch to food crops serving domestic markets; (ii) *private factor reallocation*: mining as well as sectors that benefit indirectly from mineral exports, such as urban services and construction, may attract capital and (skilled) labour through higher expected returns and wages; (iii) *fiscal-political reorientation*: governments may prioritize mining as a relatively accessible source of fiscal revenue, leading to reduced public investment in export agriculture (e.g. transport and energy infrastructure, input subsidies, extension services); (iv) *ecological damage*: pollution, and deforestation associated with mining (e.g. mercury contamination) may undermine the ecological conditions for crop cultivation; (v) *crowding-in*: under particular institutional conditions, mining can actually generate productive linkages or increased investment capacity that stimulate the development of commercial agriculture.

Crowding-in effects are not unique to OECD countries. Evidence from colonial Africa likewise points to the co-evolution of mining and export agriculture, although this often occurred under conditions of intense labour coercion. Under colonial rule, the economic linkages between mining and agriculture operated in at least three ways. First, mining enclaves required food which was often supplied across considerable distances (Frankema and Westland 2026). In so far land and labour were allocated to serve domestic demand for food, it may have crowded out agricultural export production. Second, mining activities required transport

⁵ Several supposed resource curses have been contested. For example, the link with conflict has been disputed by studies stressing that the quality of institutions determine how natural resources are governed and that commodity dependence is endogenous to institutional quality (Brunnschweiler and Bulte 2008; Bazzi and Blattman 2014).

infrastructures, such as roads, railways and port facilities, that also facilitated the export of agricultural commodities (Jedwab and Moradi 2016). And third, colonial state revenues and the profits generated by concession companies were partly reinvested in the expansion of this infrastructure.

To be sure, a considerable share of the surpluses generated by the combined growth of export agriculture and mining accrued to colonial investors rather than to indigenous farmers, workers or traders. The colonial political economy allowed for a process of ‘crowding in’ precisely because it served the interests of metropolitan capital. In the post-colonial era, the political economy of export-led ‘development’ changed. Especially since the 1970s mechanisms of crowding-out show more clearly, but in a different way than standard resource curse theory predicts: emerging mining sectors did not crowd out existing export agriculture, but they instead impede the revival of the sector after a collapse caused by exogenous factors such as civil warfare, drought, or fiscal predation.

3. The African Commodity Trade Database (ACTD)

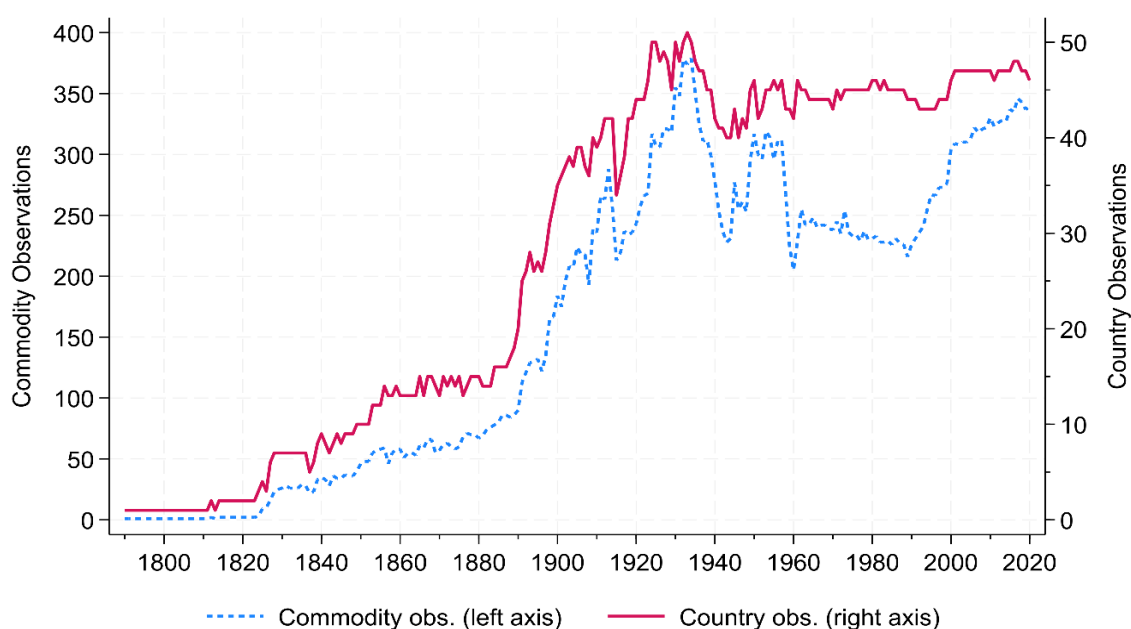
The empirical analysis of this study draws on the new *African Commodity Trade Database 2.0*. The ACTD 2.0. covers the period 1790–2020 and includes 51 (modern) African countries, for which we compiled annual data on (i) total export and import values (at current prices) and (ii) the value, volume, and unit prices of each country’s main export commodities. We compiled all export commodities that, at some point, accounted for approximately 5% or more of total annual export value and retained them even if their share subsequently fell below this threshold.⁶ ACTD 2.0 includes 193 unique export commodities drawn from 260 primary and secondary statistical sources. Comprising 39,800 annual country–commodity observations, this dataset represents a fourfold expansion of the original ACTD 1.0 (Frankema et al. 2018), extending its spatial coverage from 22 to 51 countries and broadening its temporal scope from 1820-1939 to 1790-2020. The average length of all country series is 130 years, out of a maximum of 230 years. Whereas the ACTD 1.0 covered British and French colonies until 1939, the new version has been expanded to include Belgian, German, Italian, Spanish and Portuguese colonies until and beyond their respective dates of independence. By connecting (some) pre-colonial to colonial and post-colonial trade series the ACTD 2.0 is currently the largest and most complete commodity trade database on 19th and 20th century Africa.⁷

⁶ Cabo Verde, Comoros, Djibouti, and São Tomé and Príncipe are excluded. Réunion is included until 1960, although it became an overseas department of France in 1946.

⁷ For example, we include 51 countries, while Mitchell (2003) *International Historical Statistics* on external trade only report export values and major commodities for 13 African countries during 1865-1909, 20 for 1910-1944 and 21 for 1945-2000. The *World Trade Historical Database* compiled by Federico and Tena (2019) provides near-universal coverage of African countries but report only annual export and import values for the period 1817–1938, without data on commodity-level values or volumes and excludes precious metal exports in the total export values (except for South Africa) and pre-colonial values guesstimated.

Figure 1 charts the data coverage of the ACTD 2.0. It starts in 1790 with a series of British imports from West Africa and subsequently includes early colonial outposts in West Africa from Senegal, Sierra Leone, the Gambia, Ghana, Nigeria, as well as Mauritius, South Africa and Egypt.⁸ For the period up to 1890 the database not only relies on export statistics, but also on recorded imports from West Africa into Britain and France to approximate African exports. The coverage of African trade improves considerably with the onset of colonial rule following the Scramble for Africa and the associated expansion of colonial statistical reporting in the 1890s. In 2.8% of cases, when either the export value or export volume was missing, we inferred the missing data from the average commodity-specific unit value ratio (UVR) of all other African exporters. Local currency values have been translated into British Pounds, US Dollars and French Francs using official exchange rate series (Officer 2026).

Figure 1: Number of African countries and commodity observations in ACTD 2.0



Source: ACTD 2.0

The ACTD 2.0 draws on hundreds of distinct trade reports and secondary publications. For the colonial era, the principal sources consist of a wide range of colonial trade reports published by metropolitan and local African statistical agencies. For the 1960-2020 era, we primarily relied on the *International Trade Statistics Yearbooks* and the UN COMTRADE online database. When agricultural commodity values and volumes are missing from COMTRADE we used the official values and estimations provided by FAOSTAT's trading partners database. We also corrected a considerable number of errors in COMTRADE, using UVRs as detection instrument. We complemented the database with numerous national, secondary sources, and international collections of trade data including the *Stateman's Yearbook* and Mitchell's (2003)

⁸ Historical territories are referred to by their present-day country names throughout the paper.

International Historical Statistics on external trade when data was missing. The ACTD 2.0 contains an extensive description of its sources.

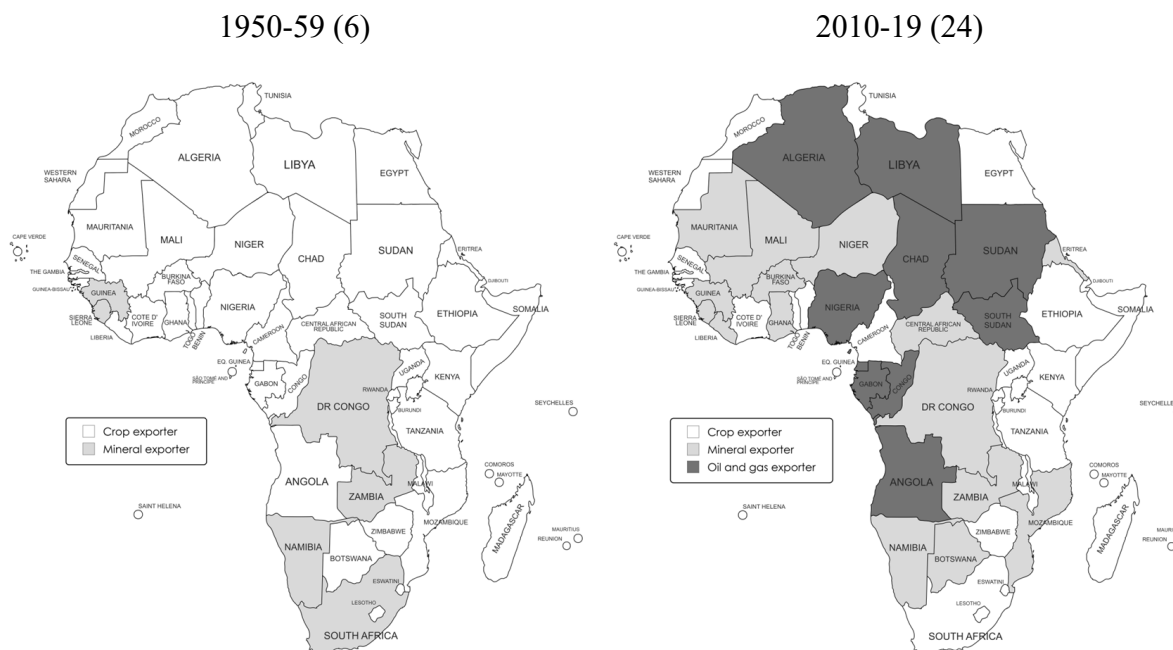
Whereas the ACTD 2.0 is the most comprehensive historical trade database on Africa, it doesn't come without some limitations. The biggest omission is that long-distance trade *within* Africa across political or ethnic borders is not accounted for until the beginning of the colonial period, for the simple reason that colonial borders as well as systematic recording of trade flows were not in place yet. Also, during the colonial and post-colonial eras these flows were only captured in part. To estimate the relative share of overland trade to seaborne trade goes beyond the scope of our project but remains an important research agenda in African economic history to shed light on trade diversion in the century between 1850 and 1950. A second limitation is that the ACTD 2.0 does not include detailed import commodity data, except for total import values, for the mundane reason that imports were much more diversified and harder to categorize than exports. Finally, for this study we converted all local currency export series into US Dollars and turned nominal into real values using a US CPI (see also [Deaton 1999](#)). To assess real export prices and values at the local level, long-run deflators of African economies extending back into the 19th century are needed. Such series also yet remain to be constructed.

4. Africa's Mineral Transition in Historical Perspective

Drawing on the ACTD 2.0 we present the first encompassing overview of the mineral transition in Sub-Saharan Africa. With the exception of South Africa (see above), mining activities began to expand in the early 1900s, accelerated during the second half of the 20th century, and put an end to more than a century of cash-crop-led export growth in the 1970s.⁹ We classify African economies as 'mineral exporters' if mineral commodities account for more than 50% of their annual merchandise export value. Mineral commodities include metal ores (e.g. iron, gold, copper, tin, uranium), mineral rocks (e.g. phosphate, lithium, bauxite), gemstones (e.g. diamonds), coal, oil and natural gas. Based on this rule, Figure 1 shows that in the 1950s only 6 countries/colonies qualified as mineral exporters (see Appendix Figure 2 for their relative contribution). By the 2010s, that number had risen to 24, including 9 oil exporters, representing c. 54% of Africa's population in 2020. As a robustness check, we make also classify countries at threshold values of 33% and 66% (see Appendix Table 2a-c). We will get back to these thresholds in section 6, where we examine crowding-out mechanisms and where we show that some mineral exporters on the verge of the 50% threshold behave differently from mineral exporters above the 66% threshold.

⁹ Mineral commodities such as iron, copper, tin, zinc and gold had been traded within Africa for centuries, and especially gold was key for the integration of Africa into the world economy before the surge of the Atlantic slave trades ([Breckenridge 2011, pp.245-6](#); [Eltis 1994](#)). Famously, the wealth of Mansa Musa of the Mali Empire during the early 14th century was amassed from the trade and mining of salt and gold. Our concept of the "mineral transition" refers specifically to the major change in export specialization during the long 20th century, a shift that may not have yet come to an end.

Figure 1: Africa's mineral transition, 1950s and 2010s



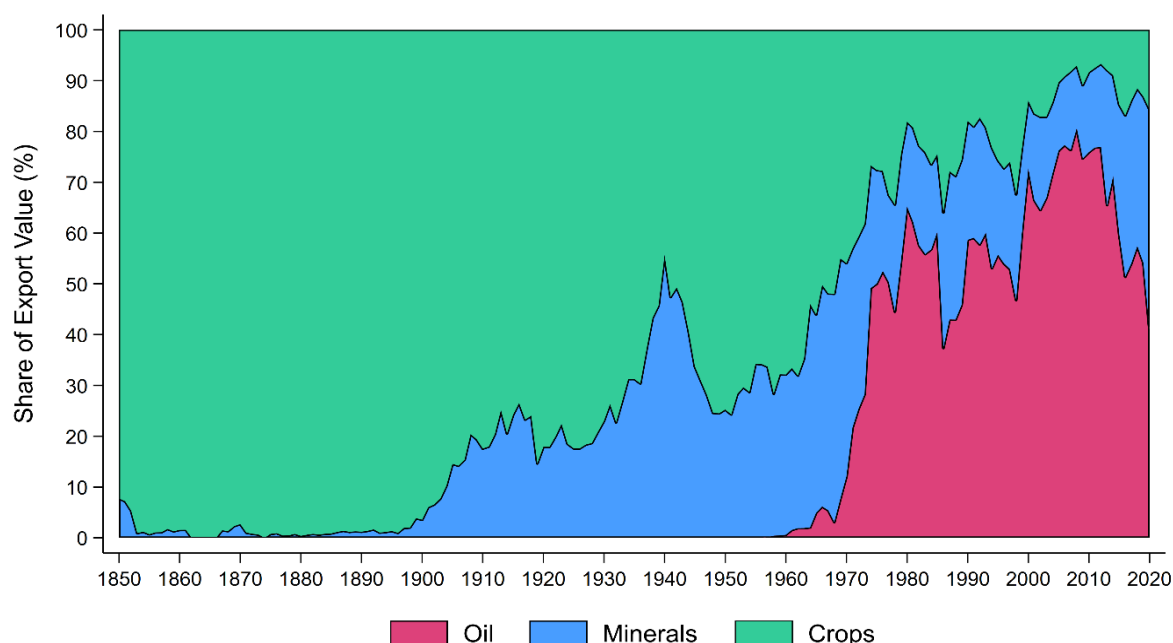
Source: Authors' own based on ACTD 2.0. See Appendix Table 2a.

Note: Classification based on decadal average >50% of total export value. White = crop exporters; light grey = mineral exporters; dark grey = oil and gas exporters. In 2010-19, Morocco, South Africa and Tunisia are not crop exporters but can be classified as manufacturing exporter.

Figure 2 charts the relative shares of Sub-Saharan Africa's agricultural and mineral exports over the 170 years spanning 1850 to 2020. Around 1900, exports from Sub-Saharan Africa, excluding South Africa, consisted near exclusively of tropical agricultural commodities.¹⁰ The first significant rise of mineral exports after 1900 occurred with the take-off of copper mining in the Central African Copperbelt located in the borderlands of the Belgian Congo and Northern Rhodesia (present-day DRC and Zambia). Southern Rhodesia (present-day Zimbabwe) also became a leading mineral producer, exporting gold, chrome ore and asbestos. From 1900 until World War I gold accounted for more than 90% of its export earnings. Gold exports remained important up to World War II, after which Southern Rhodesia quickly lost its status as a major mineral exporter and crops became dominant. Large mining concessions were also granted in German South-West Africa in 1908 and Portuguese Angola in 1912, following the discovery of diamonds (Dolan 2024; Meier zu Selhausen 2027). In Nigeria, a tin mining industry developed on the Jos Plateau after 1906 (Hodden 1959). Yet, the share of minerals in both Angolan and Nigerian exports did not overtake the value of export crops until oil, discovered in the late 1950s, began to flow in larger quantities during the oil price boom of 1973-74.

¹⁰ The export of animal products, both from wild animals (e.g. ivory, ostrich feathers) as well as livestock (e.g. hides and skins) is excluded here. It was a fraction of total exports after 1850.

Figure 2: The mineral transition in Sub-Saharan Africa, 1880-2020 (cumulative % shares of total value)



Source: ACTD 2.0.

Note: Figure includes major agricultural exports of crops comprising >5% of a country's total export value. This includes forest products but excludes livestock and animal products. North African and South Africa are excluded. For the period 1850–69, we include the regional share of British palm oil imports originating from West Africa, excluding Sierra Leone, Nigeria, and the Gold Coast (Lynn 1997, p.13, 113). For the period 1850-1890 we include the value of French imports from West African Coast. We excluded a category “other” for manufactures and services as their share remained negligible, and this study focuses on commodity exports.

Figure 2 illustrates that in the first quarter century from 1905 to 1929 the share of mineral exports hovered around 20%. A steep increase occurred during the Great Depression with a peak around 50% in 1939-1943. This rise was partly due to the severe disruption of African crop exports. Although the prices of almost all African export commodities fell in the wake of the 1929 crash, the relative decline of copper and diamond prices was smaller, and their recovery faster than that of the main export crops. Copper mines shut down and laid off thousands of African workers but revived already in 1933 (Butler 2007; Juif and Frankema 2018, p.318). International gold prices, which had fallen considerably after the collapse of the gold standard in 1914, even doubled between 1929 and 1934 and remained high throughout the 1930s. In the 1940s the gold price fell due to war-related international price controls (Backman and Fisherman 1941; Dummett 1985; Roberts 1986). During World War II, soaring international demand for strategic minerals further underpinned the boom in mineral exports, as Africa supplied all of the world's uranium (ingredient of the bombs dropped on Nagasaki/Hiroshima in 1945), 98% of industrial diamonds, 90% of cobalt, 50% of gold and 17% of global copper (Dumett 1985) which was essential for the production of shells,

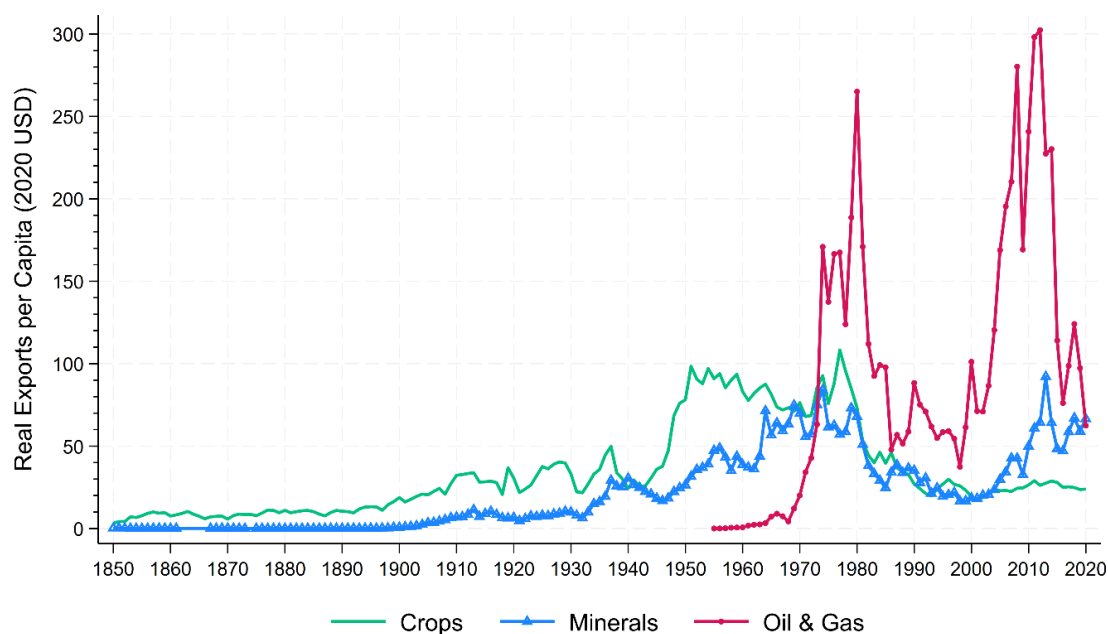
ammunition and electrical equipment (Butler 2007, p.61). After World War II the balance shifted back in favour of crops.

Meanwhile, African cash-crop farmers responded to depressed market conditions in a variety of ways: some expanded output to compensate for falling prices, others retreated into subsistence production or migrated to mining towns in the hope to find wage employment there (Brown 1989, pp.5-6). Crop prices recovered as a result of rising global demand in the late 1940s and the 1950s. The Korean war boom pushed up prices further and African farmers were granted more freedom to produce export crops in some of the settler colonies where they had previously been discouraged to do so (Frankema et al. 2016). Setting aside the volatility of the 1930s and 1940s, the share of minerals expanded from barely 4% in 1900 to c. 32% in 1960.

Then crude oil and gas came into play. During the mid-1950s the first commercial oil discoveries were made in Gabon, Angola and Nigeria. Fuelled by growing international demand and quota agreements by OPEC, African oil exports expanded dramatically during the 1970s, overtaking both crops and non-oil minerals in total export value within a single decade (Baker 1977). By 1980, oil accounted for 65% of Sub-Saharan African exports, and it has remained the dominant commodity ever since, albeit with major fluctuations driven by the exceptional volatility of international oil prices. The declining share of crops to, on average, 25% of African exports in 1980-2000, was not only the result of a surge in mineral export revenues though. In the wake of inflation and rapid demographic growth, agricultural exports had by 2000 lost about 75% of their contribution to real per capita trade revenues relative to 1980. After 2008, the share of oil in Sub-Saharan African exports fell back sharply from 81% to 41% by 2020. Over the same period, the relative share of non-oil minerals (especially copper and gold) increased from 12% to 44%, while that of tropical crops recovered from 7% to 16%.

Figure 3 illustrates the long-run evolution of real per capita export revenues. Combined, African crop and mineral export revenues increased fivefold, from 10 to 55 USD (in constant 2020 prices), between 1860 and 1939, and then rose a further fivefold, reaching approximately 250 USD by the 2010s. It highlights not only the decline of agricultural commodity exports since the late 1970s, but also the substantial impact of the oil price booms in the 1970s and 2000s. In addition, it shows the rapid surge of non-oil minerals over the past two decades, extending the broader expansionary trend observed between 1945-1980. The key insight conveyed by Figure 3, however, is that (i) until 1980 the mineral transition largely unfolded alongside the growth of commercial agriculture; (ii) between 1980 and 1998, real per capita export revenues from all three commodity types contracted; and that (iii) since 1998, there has been a clear break from this long-run pattern of co-evolution: mineral export revenues have surged, whereas those from commercial agriculture have remained substantially below their 1950-1980 levels.

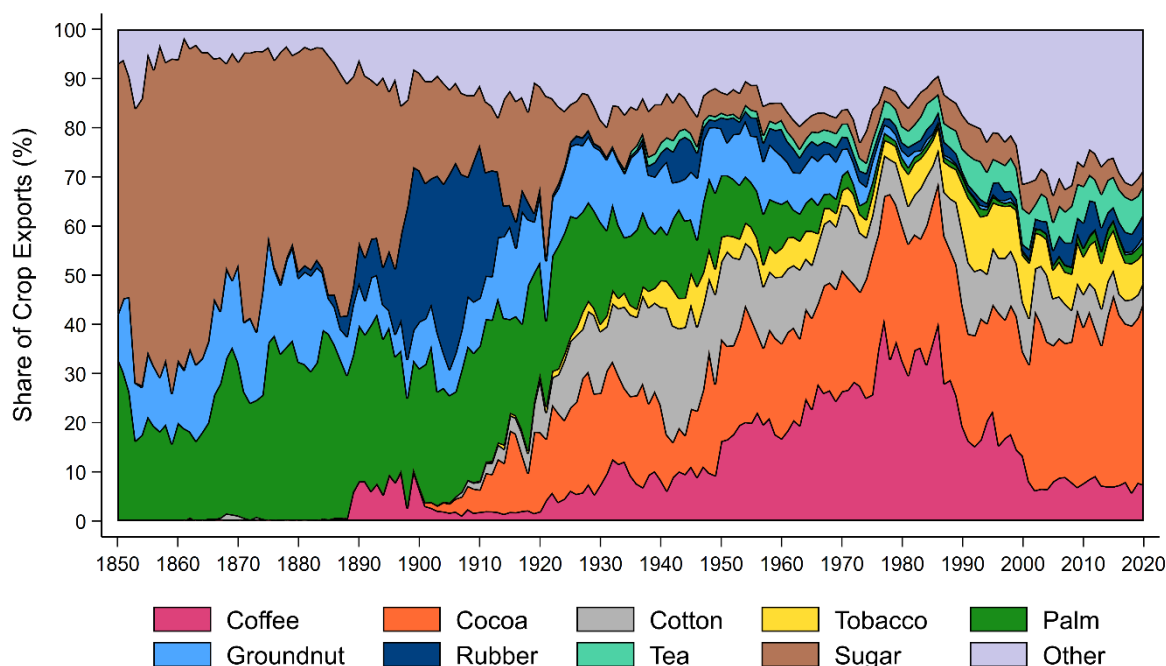
Figure 3: Mineral and crop exports per capita, 1850-2020 (constant USD 2020)



Note: See Figure 2.

Africa's mineral transition thus began when the so-called "cash-crop revolution" was in full swing (Tosh 1980), and for a long time commercial agriculture and mining expanded in tandem. Figure 4 charts the composition of Sub-Saharan Africa's major crop export values over the period 1850-2020. During the late 19th century sugar from Mauritius and West African palm oil/kernels and groundnuts spurred African export growth. A short-lived rubber boom occurred between 1890 and 1910, largely in the Belgian Congo and Portuguese Angola. However, the dominance of sugar, palm products, groundnuts and rubber in Africa's late 19th century exports gave way to a more diversified export structure after 1900. During the beginning of the 20th century, cocoa exports from the Gold Coast and groundnut exports from the Senegambia and Northern Nigeria entered the mix. After World War I, the range of tropical export crops further widened, as exports of cotton, mostly from the Sudan and Uganda, and coffee, cultivated in Ethiopia, Kenya and Tanzania, soared. After World War II, cocoa and coffee exports became Africa's most profitable cash-crops, while sugar, palm products and groundnuts declined in relative importance. Their joint dominance lasted until the late 1980s, when cocoa, mostly grown in Cote d'Ivoire and Ghana, became the leading agricultural export earner, while West African cotton, East African tea, tobacco from Zimbabwe, and other crops (wood, flowers, spices, coco(nuts), and tropical fruits) increased in relative terms.

Figure 4: Composition of crop exports from Sub-Saharan Africa, 1850-2020 (cumulative % shares of total value)



Source: ACTD 2.0.

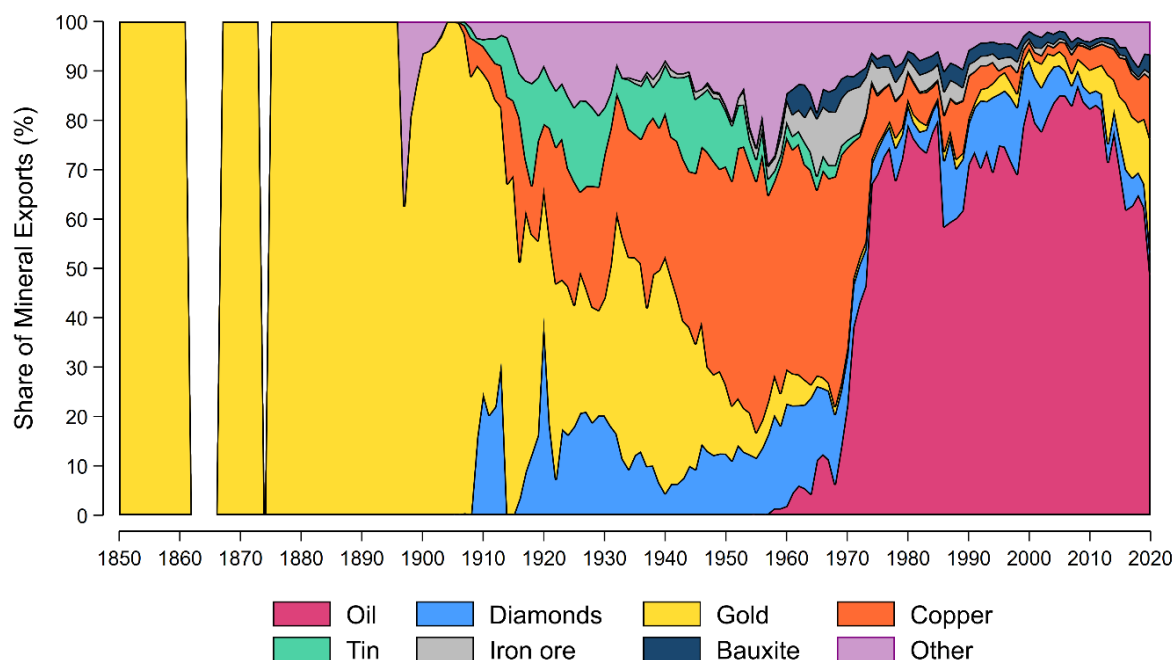
Note: Figure includes major agricultural exports of crops comprising >5% of a country's total export value. Figure excludes North African and South African exports. Cocoa includes beans, paste, butter, oils and fats. Cotton includes cotton ginned and combed/carded. Palm includes palm oil, palm kernel, palm kernel oil and palm cakes. Groundnuts include groundnut shelled/unshelled and groundnut oil. For the 1850-69 period palm includes the regional share of British palm oil imports from West Africa outside Sierra Leone, Nigeria and Gold Coast (Lynn 1997, p.13, 113). For 1850-1890 we include the value of French imports from West African Coast.

Figure 5 shows the export value of the seven major minerals produced in Sub-Saharan Africa from 1880 to 2020. In contrast to the diversification during the cash-crop revolution, mineral export growth unfolded in three overlapping eras, successively dominated by gold (1880-1940), copper (1940-70), and crude oil (1970-2020). In the past decade the share of oil has declined considerably due to favourable international gold and copper price developments. What Figure 5 does not show is the resurgence of labour-intensive mining across the African continent. While oil production is by nature highly capital- and skill-intensive, the sharp rise in global gold prices and critical rare earth metals essential to the digital revolution and energy transition, has led to an impressive expansion of artisanal and small-scale mining (ASM), together with its social and environmental impacts (Girard et al. 2025). According to the World Bank (2019, p.13) c. 2 million artisanal miners were active in Sub-Saharan Africa in 1999, whereas by 2020 c. 10 million workers were directly involved in ASM and a further 60 million in associated downstream services and industries.¹¹ While in output terms ASM remains considerably

¹¹ On an estimated total labour force of c. 416 million in 2019 this is respectively 2.4% and 14.4%.

smaller than the industrial mining sector, the share of ASM in total exports has risen to double-digit figures in many African countries (World Bank 2019).

Figure 5: Mineral export composition of Sub-Saharan Africa, 1850-2020 (cumulative % shares of total value)



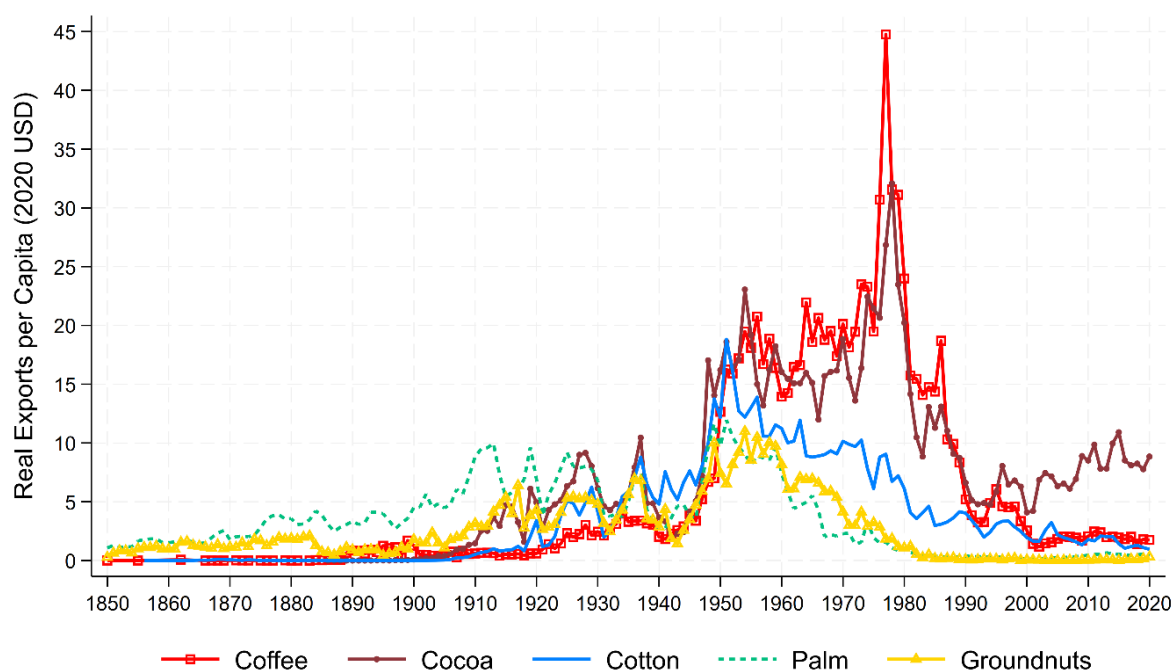
Source: ACTD 2.0.

Note: Figure includes major mineral exports of minerals comprising >5% of a country's total export value. Figure excludes North African and South African exports. Bauxite includes ores and refined products. Copper includes ores and refined products. Gold exports from the Gold Coast in 1860s and 70s halted due to the Anglo-Asante wars. Guana exports from German South-West Africa in 1890s explain the short-lived expansion of "Other" minerals.

Figures 6a-c show, in greater detail, the long-run rise in real per capita export values of Africa's five leading tropical export crops between 1890 and 1980, before plummeting after 1980 to levels comparable to those of the late 19th century. While demographic growth is factored into these figures, the total export volume of coffee, groundnuts and palm oil have also shrunk compared to their mid-20th century peaks (Figure 6b). Although cotton exports grew modestly, especially in Mali, Burkina Faso, and Benin, their value in per capita terms collapsed. Only cocoa held its ground thanks to booming production in Cote d'Ivoire after 1970, which offset the dwindling cocoa exports of Ghana during 1980-2000 and, more in general thanks to relatively favourable price developments (Austin 2005; Cogneau and Jedwab 2012; Frankema et al. 2016).¹² Yet, as Figure 6c reveals, there was not a single crop whose export volume growth kept pace with population growth.

¹² By expressing these series in per capita values demographic growth is factored into the comparison. Yet, also in absolute volumes the 'traditional' African cash-crops are nowhere near their mid-20th century peaks today.

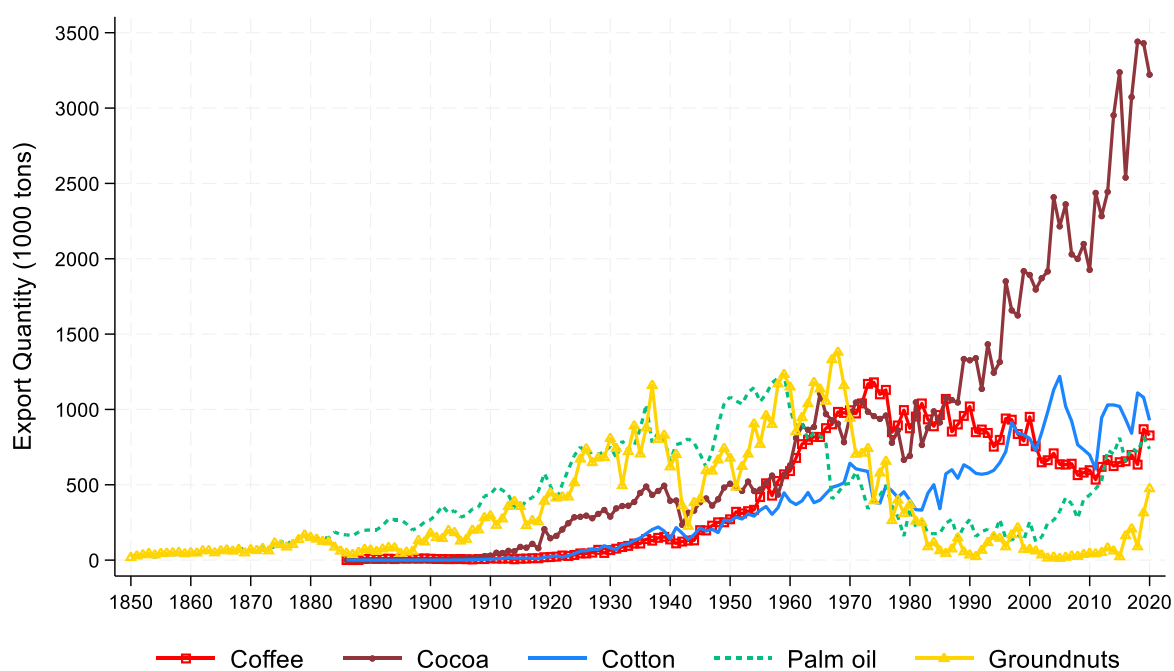
Figure 6a: Real per capita value of crop exports from Sub-Saharan Africa, 1850-2020 (constant 2020 USD)



Sources: ACTD 2.0. Per capita values constructed from historical population estimates by [Frankema and Jerven \(2014\)](#) and [UN \(2023\)](#). All export values are deflated using a US CPI from [Officer and Williamson \(2024\)](#).

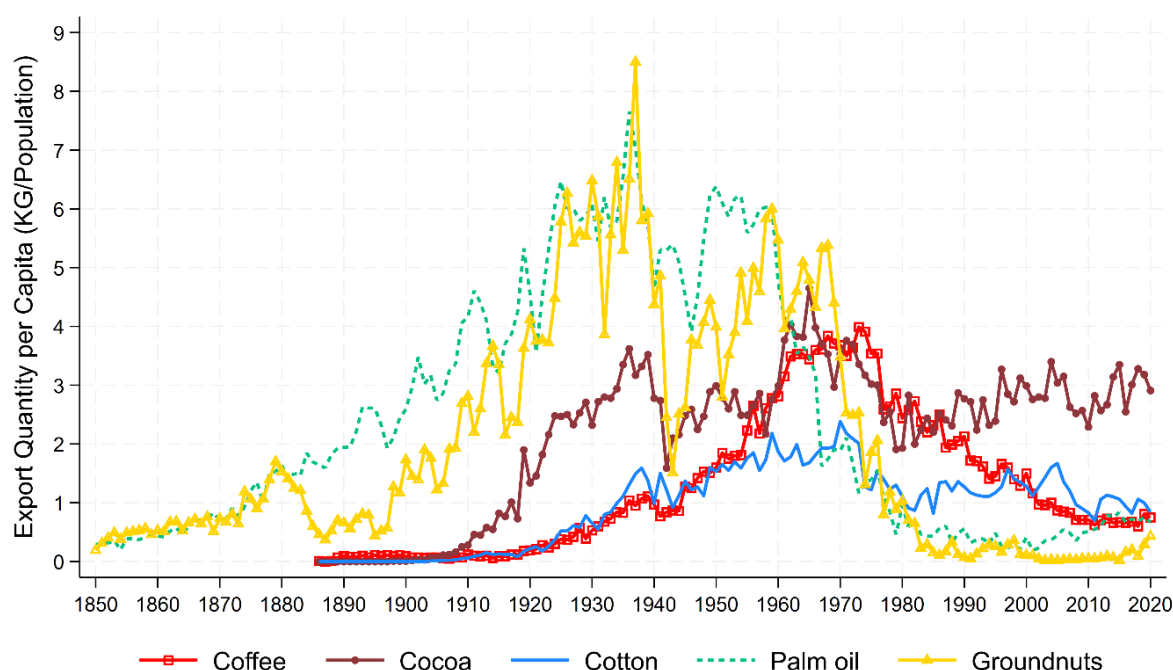
Note: Figures include all Sub-Saharan African countries excluding South Africa. See Figure 3.

Figure 6b: Volume of crop exports from Sub-Saharan Africa, 1890-2020 (1000 metric tons)



Source: ACTD 2.0.

Figure 6c: Volume per capita of top 5 export crops, 1850-2020 (KG/Population)



Sources and notes: See Figure 6a.

In sum, over the course of the long 20th century, 24 Sub-Saharan African export economies made a shift towards minerals. The mineral transition has not contributed as much to the diversification of African exports as the earlier commercial transition and cash-crop revolution of the late 19th and early 20th centuries have done. Moreover, the mineral transition has been driven not only by the growth of mineral exports, but also by the stagnation and, in some cases contraction, of Africa's 'traditional' agricultural commodity exports. To what extent can the observed decline in agricultural commodity exports be attributed to crowding-out effects generated by the rise of mineral exports? To what extent are other factors, such as changing relative prices, to blame instead? A first step toward disentangling these mechanisms is to separate long-run trends in export volumes from long-run prices.

5. Commodity-Specific Terms of Trade, 1850-2020

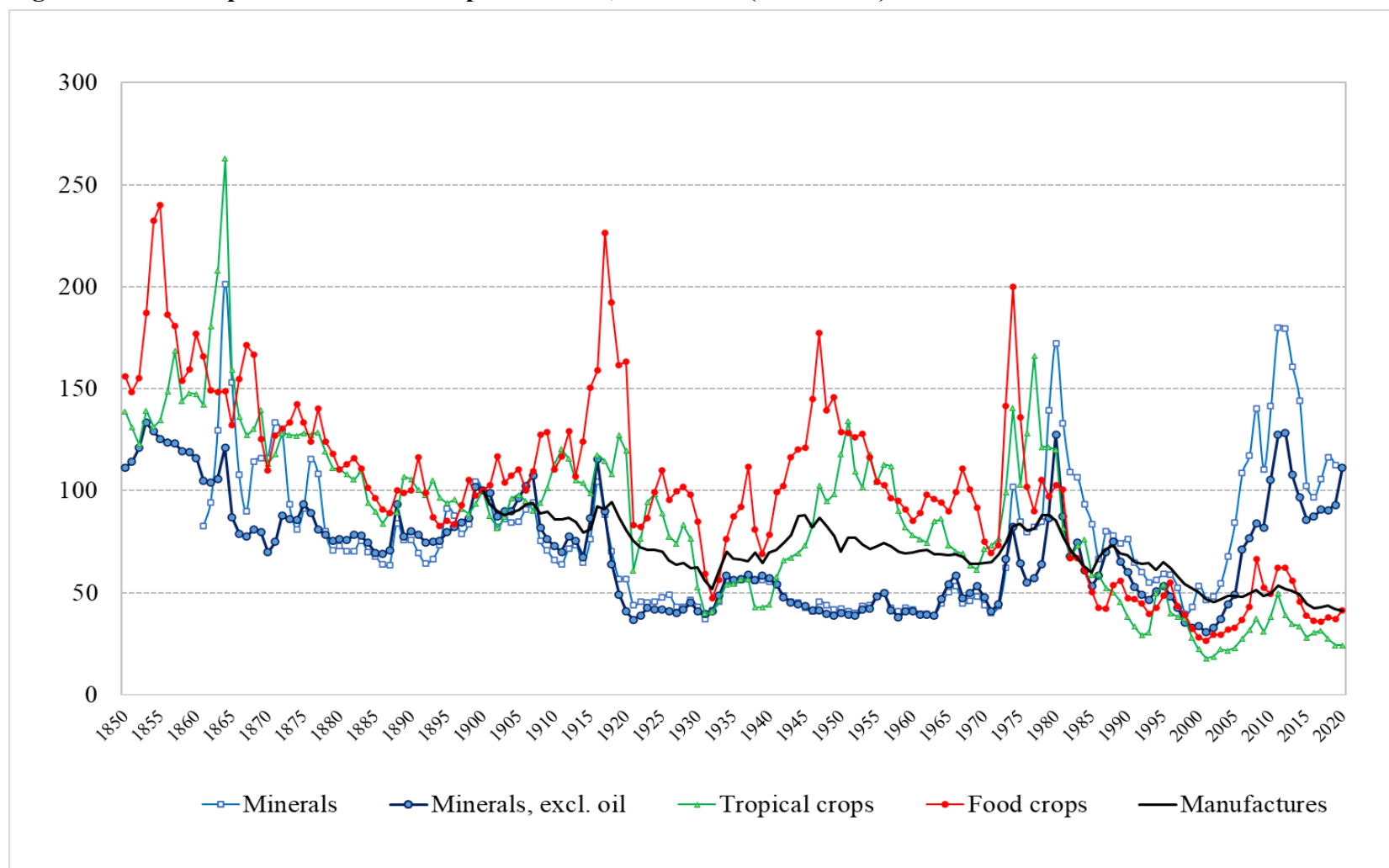
The tendency of occasionally booming primary commodity prices to revert to a long-term mildly downward sloping price floor plays a central role in [Deaton's \(1999\)](#) explanation of persistent African poverty. [Deaton \(1999, pp.32-33\)](#) demonstrates that the World Bank consistently overestimated future coffee and copper prices from the 1970s to 1990s, largely because its forecasts neglected the historical tendency of commodity prices to revert to their long-run trend. Drawing on Arthur Lewis' theory of unlimited supply of labour ([Lewis 1954](#)), Deaton argues, against dependency theorists, that prices revert to a long-term floor because unforeseen demand shocks elicit strong supply-side responses. The availability of abundant

labour and land allows producers to expand output rapidly, thereby offsetting the initial price increase and restoring prices toward their historical trend.

However, right at the time Deaton published his article, a historically unique price divergence set in between crops and minerals. In Figure 7 we trace the evolution of real prices for both commodity groups from 1850 to 2020, extending [Deaton's \(1999, p.28\)](#) long-run price analysis by 70 years. The graph shows five composite, unweighted international price indices: (i) a *mineral* index including long-term prices of oil, copper, gold and aluminium; (ii) a *mineral* index excluding oil; (iii) a *tropical crop* index including palm oil, cotton, coffee and sugar; (iv) a *food crop* index based on rice, maize and wheat; and (v) a *manufacturing* index based on a larger basket of industrial products constructed by the World Bank for the post-1960 era, and extrapolated back to 1900 (the base year) using the index of [Grilli and Yang \(1988\)](#). To convert nominal into real prices, we follow Deaton's approach of deflating all series by the US CPI prior to aggregation, using the series of [Officer and Samuelson \(2026\)](#). Long-run price trends are thus expressed in their relative purchasing power on the US market. In contrast to the subsequent terms-of-trade analysis (Figure 8), we have not weighed these price indices by their changing shares in total African exports.

Figure 7 demonstrates that tropical agricultural commodities have seen a prolonged decline in prices relative to other commodities since the mid-19th century. Food crops have followed a similar decline, albeit slightly less pronounced. This downward trend has been interrupted by four occasional price booms in the wake of some major economic shocks: (i) in the 1860s in the wake of the US civil war, (ii) in the late 1910s due to the inflationary spike at the end of World War I, (iii) in the 1940s-50s during (the aftermath of) the World War II and the Korean War, and (iv) in the 1970s following the two major oil crises of 1973-4 and 1979-80 which were triggered, respectively, by the Yom Kippur War and the Iranian Revolution. During these booms, not all commodities experienced similar price hikes. For example, during the 1860s food prices did not mirror the spike in cotton prices. During the 1940s-50s the price of minerals barely moved and were partly subjected to price controls. In the 1970s, cereal prices did respond to the first, but not to the second oil crisis.

Figure 7: Real composite world market price indices, 1850-2020 (1900 = 100)



Sources: See Appendix Table 3 for a detailed description of sources and index construction methodology.

Note: Aluminium added to minerals from 1900 onwards. Manufacturing index starts in 1900.

The post-1998 mineral price boom is historically exceptional in at least four respects. First, in terms of both magnitude and duration: the still on-going price boom has already lasted longer than any previous recorded price boom over the past 170 years. Second, it has created a historically unprecedented price divergence with tropical crops, cereals and manufactures. Third, it marks a sharp break from the 1920-1970 period, during which mineral prices were effectively tied to the floor that Deaton observed. Fourth, contrary to earlier booms, there is no clear direct association of booming mineral prices with political instability or violent conflict. All these observations hold for the mineral price index including *and* excluding oil.

How, then, did the mineral price boom affect Africa's terms of trade? We construct an annually reweighted composite net barter terms of trade index for Sub-Saharan Africa's 10 major crop exports (from Figure 4) as well as for 7 major mineral commodities (from Figure 5) including and excluding oil, using the following estimation procedure:

$$NBTT_t = 100(P^x_t / P^m_t)$$

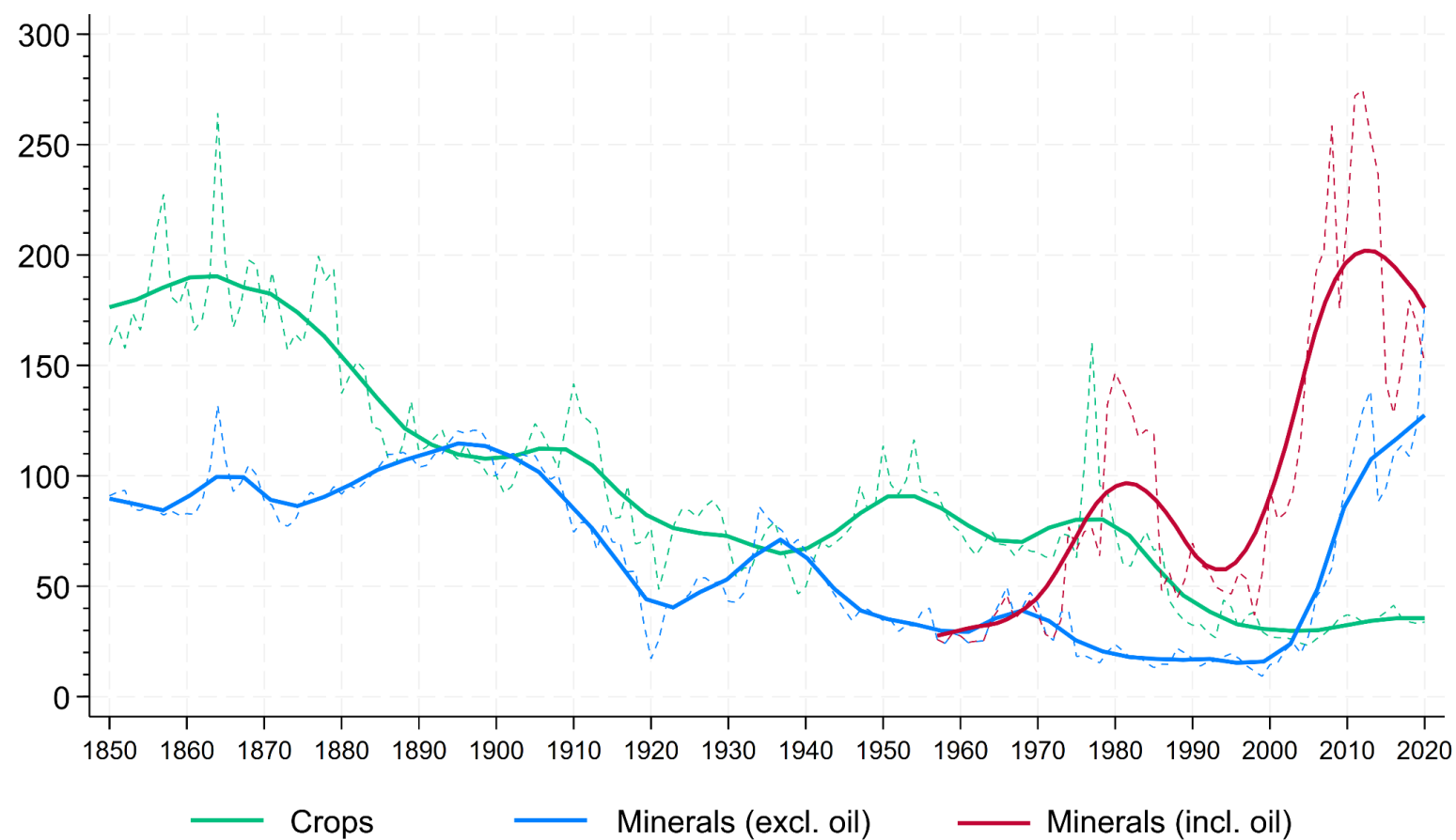
$$\text{in which } P^x_t = \sum_i w^x_{i,t} \cdot I^x_{i,t} \text{ and } P^m_t = \sum_j w^m_{j,t} \cdot I^m_{j,t}$$

$$\text{and in which } I^x_{i,t} = 100(p^x_{i,t} / p^x_{i,0}) \text{ and } I^m_{j,t} = 100(p^m_{j,t} / p^m_{j,0})$$

$$\text{where } NBTT_t = 100 \text{ in the year 1900.}$$

The African export crop index series ($I^x_{i,t}$) includes the annually value-weighted shares of cocoa, coffee, cotton, groundnuts, palm kernels, palm oil, rubber, sugar, tobacco and tea from ACTD 2.0. The commodity export prices ($p^x_{i,t}$) are estimated using UVRs obtained by dividing their total export value over total export volume (all UVRs are noted in GBP/kg). The NBTT for minerals is based on the index series of aluminium ore (bauxite), copper, diamonds, gold, iron ore, tin (cassiterite) and oil. For export prices we use world market price series as a proxy, since we consider the UVRs less reliable. For the import side we use, in all cases, the British export price index for 1850-1960 from [Mitchell \(1988, pp.526-28\)](#), which we link to the [World Bank's \(2026\)](#) manufacturing price index for the period 1960-2020. We present a smoothened terms of trade series using a Hodrick–Prescott filter with λ set at 100. Figure 8 presents the results.

Figure 8: Net barter terms of trade of African crop and mineral exports, 1850-2020



Notes: Solid lines show local polynomial smooths (lpoly) of the annual data (dashed).

Figure 8 illustrates that the terms of trade of oil and non-oil minerals have followed different long-run trends. For Sub-Saharan Africa, this became important from 1969 onwards, when the share of oil in total exports ballooned (see Figure 2 and 3). Oil exporters witnessed a sustained, albeit very volatile, rise in their terms of trade. African countries exporting copper, gold, diamonds, iron, tin, or critical metals such as cobalt and lithium, saw a sharp improvement in their terms of trade after 1998, when the prices of other minerals began to converge with oil.¹³ Except for aluminium, which experienced a notable decline in real prices, mineral exporters benefited from favourable demand conditions. For crop exporters the 1980s marked the decade in which real prices lost ground against all other commodities, and from which they are yet to recover.

Were mineral commodity prices also more volatile than agricultural commodity prices? This question is pertinent as a sizeable literature has argued that it is not the long-term terms of trade, but rather commodity price volatility that leads to unfulfilled growth potential (Hnatkovska and Loayza 2004, Blattman et al. 2007; van der Ploeg and Poelhekke 2009, Jacks et al. 2011; Williamson 2012). Table 1 presents a price volatility comparison of 26 tradable commodities, focussing on short-run price deviations from the long-term trend, using a 10-years rolling coefficient of variation to smoothen long-term price trends (cf. Bateman 2014). This approach allows us to analyse price deviations from the trend for a time span of 60 years.¹⁴ The table highlights that mineral prices have been relatively volatile, especially in comparison to manufactures, but also in comparison to food crops. Overall, however, mineral commodities did not exhibit greater price volatility than the tropical crops that African economies have specialised in over the past two centuries. Oil prices have been more volatile than those of any other mineral or crop (except sugar), but the windfall gains from two prolonged oil price booms were large enough to offset these effects through considerably higher growth rates.

What explains this major departure of mineral prices from their long-run trend? Has the floor shifted, or is this just an exceptionally long boom? This question is too large for this paper, but one aspect of it is highly relevant for the transition we seek to understand: labour. Assuming that the demand for minerals has been driven by a combination of Asian (especially Chinese) industrialization, the digital revolution and energy transition, and investors seeking safe havens (e.g. gold) in times of rising geo-political instability, it is the lagging supply side response that poses the puzzle.

From an African supply-side perspective, the resurgence of labour-intensive mining is the most remarkable aspect of the price boom. During the colonial era, cash-crop farmers and mines competed for scarce supplies of manual labour. Forced and voluntary long-distance migration of millions of African workers kept these sectors afloat. While cash-croppers depended mostly on circular rural-rural migration, more permanent forms of migration initiated

¹³ Aluminium reserves are so abundant that it takes an estimated 24,000 years before these will be depleted at current rates of extraction (cf. Henckens 2016).

¹⁴ As a robustness check we computed coefficients of variation over a 15-years and a 7-years moving average. It doesn't make a difference for the comparison, only for absolute levels.

urban settlement in the vicinity of mines (De Haas and Frankema 2022; De Haas and Travieso 2022). Whereas farming remained comparatively labour-intensive, the mining sector increasingly adopted labour-saving technologies. The coercive labour market institutions of colonial times (e.g. corvée labour, land alienation schemes, hut and poll taxes) were relaxed during the post-colonial era as rapid demographic growth led to increasing un(der)employment (Frankema and Van Waijenburg 2018; Paice 2021).

Table 1: Real commodity prices and volatility, 1960-2020

	<i>Mean annual growth 1960-2020 (ln)</i>	<i>Coefficient of variation (average of 10y rolling CV)</i>
Manufacturing index	-0.87	0.08
Energy	2.22	0.34
Oil (crude, brent)	2.71	0.36
Natural gas	1.72	0.32
Minerals	1.18	0.25
Aluminium	-0.71	0.16
Iron	1.04	0.21
Copper	0.96	0.25
Phosphate	0.22	0.34
Tin	0.70	0.23
Zinc	0.98	0.28
Gold	3.81	0.24
Silver	2.47	0.32
Tropical crops	-0.73	0.25
Coffee (Arabica)	-0.59	0.29
Cotton (A Index)	-1.25	0.18
Cocoa	-0.40	0.27
Palm oil	-0.71	0.25
Groundnut oil	0.03	0.21
Rubber (SGP/MYS)	-1.39	0.27
Sugar	-0.30	0.42
Tobacco (US import)	-1.20	0.13
Food crops & meat	-0.14	0.17
Wheat (US HRW)	-0.41	0.19
Rice (Thai 5%)	-0.17	0.24
Maize	-0.53	0.19
Sorghum	-0.14	0.17
Barley	-0.09	0.17
Soybeans	-0.24	0.16
Beef	0.36	0.15
Chicken meat	0.10	0.08

Source: World Bank Commodity Price Database (The Pink Sheet), v. Sept. 05, 2023

Summing up, there is a long-run U-curve in the labour-intensity of African mining: the left downward leg must be attributed to mechanization in response to historical labour scarcity, while the right upward leg reflects a chronic lack of alternative (rural) employment opportunities in the context of on-going labour force growth. The boom in artisanal gold mining, which is also visible in other parts of the global South, illustrates this process well. Since the early 2000s, millions of Africans have been attracted to gold-digging, but their production volumes, while not negligible, are too small to lower international gold prices. On the contrary, the dazzling tenfold gold price hike between 2000 and 2020 (roughly a fivefold rise in real terms) has attracted millions of artisanal miners. Given that an estimated 18% of Africa's land surface contains alluvial gold deposits (Girard et al. 2025) the growth of ASM is unlikely to end if the yawning gap between gold and crop prices remains in place.¹⁵ In other words, if Lewis theory of unlimited labour supply is valid for understanding long-run price behaviour, it does a better job for agricultural commodities than for minerals.

6. Crowding-Out of Crop Exports?

The terms of trade patterns shown above offer ample reason to believe that relative price developments explain much of Africa's mineral transition: crops remained tied to a gradually declining price floor, whereas mineral prices diverged markedly from it. To be sure, price booms have been major drivers of growth in African export revenues, as evidenced by the oil booms of the 1970s and 2000s, as well as the current ASM gold rush and lucrative prices of critical minerals. However, the concomitant decline in the export of agricultural commodities is not so easy to link to the price scissors as may seem at first sight. Instead of long-term cycles of expansion and gradual contraction, the dominant pattern in the postcolonial period appears to be one of widespread collapse and divergent trajectories of subsequent recovery. In fact, there was a remarkable disconnect between international price trends and agricultural export volumes, where price elasticities often appeared to run in the opposite of the expected direction.

This section combines an in-depth study of secondary literature to disentangle the multiple determinants and contexts of crop export collapse after independence, with a comparative analysis of post-collapse recovery trajectories. This approach uncovers a striking pattern that has escaped the attention of the resource-curse literature: whereas the collapse of agricultural export sectors in Africa was mostly unrelated, or only very indirectly, to the emergence of mineral export industries, the recovery of agricultural exports following a major collapse was considerably less likely in a context with minerals, than in one without. Put differently, straightforward crowding-out mechanisms associated with mining *did not cause the decline of crop exports*. Instead, the presence of mineral sectors *impeded their revival*.

¹⁵ According to Girard et al. (2025, p.2579), c. 18% of the African continent's surface is suitable for artisanal gold mining.

Table 2 presents 32 African cases of collapsing agricultural exports during 1966-2020 that are evenly divided over crop exporters (16) and mineral exporters (16) using the 50% threshold for 2000-2019. It lists the country (1), the crop (2) and the period of the collapse (3). Column 4 expresses the magnitude of the export volume that was lost as a percentage share of the average annual export volume of the 10 years preceding the collapse. Next, in column 5, we qualify the nature of the specific world market commodity price trend during the first three to five years of the collapse. A flexible window is required because farmers' planting decisions respond to price developments with a delay, and the duration of this response is crop-specific.¹⁶ Taking crop characteristics into account, we describe the price trend as: (i) stable (moving within a confined band), (ii) favourable (moderately up), (iii) unfavourable (moderately down), (iv) boom (exceptional rise), (v) bust (exceptional fall) and (vi) recovery (up after a bust).

Column 6 expresses the crop's economic importance as the average percentage share in total export value in the 10 years preceding the collapse. Column 7 reports the recovery rate of the crop. We apply a volume measure to rule out the effect of price volatility. The recovery rate is measured as the average annual export volume in the years 2016-2020 – i.e. the final 5 years of the ACTD and just before Covid started to impact trade - relative to the 10-year average export volume preceding the collapse. With this measure we capture the long-run capacity of the sector to recover from a major shock. Finally, column 8 classifies the main cause(s) of the crop export collapse into five categories. We acknowledge that the dynamics of collapse always involve multiple, interacting forces operating in specific social, political and geographic contexts which are never fully comparable. Because of this complexity and context-specificity, statements about “main” causes can be subject to debate. Our interpretation is based on an in-depth study of the historical literature on each of the 32 cases, documented in Appendix Table 4. We use this classification in the analysis that follows.

War, violence & displacement

In 14 of the 32 cases, we identify large-scale political violence as the main cause of the collapse. This violence often emerged in the context of a civil war, but in several cases, it was also a result of extreme state repression. Clear and undisputed examples are the collapse of the coffee and tea export sectors in 1993-95 in the wake of the Rwandan genocide. Farmers were killed or fled their farms to escape massacre. Domestic and international transportation came to a halt and marketing infrastructures broke down (Desforges 1999). As international coffee prices fell dramatically in the six years preceding the genocide (1986-1992), it cannot be ruled out that the bust in coffee prices was one of several factors contributing to the genocide (André and Platteau 1998; Desforges 1999; Verwimp 2003). However, the violence and displacement itself were the direct cause of the collapse of 95% of coffee exports in 1994, not the price bust of the

¹⁶ For example, in commercial cotton agriculture plants are grown and harvested in the same season. When prices plunge in year t , a supply response in $t+1$ is feasible. For perennial crops such as cocoa or vanilla, planting decisions in year t affect harvests only in year $t+3$ or even later, so that price responses can only take the form of holding back part of the harvest. Storability is, therefore, another part of the story, if farmers have the resources to survive a period of holding-back in anticipation of better times.

years before. It took Rwanda until 2004 before the export volumes of coffee returned to 1993-levels.

Another example is the near complete destruction of agricultural exports in Angola during 27 years of civil war (1975-2002). By the 1990s, Angola on average exported only 1.6% of the volume of coffee it had exported in the early 1970s, while the production of cotton, tobacco and sugar had ceased altogether (Hodges 2003). Large plantations as well as smallholder coffee farmers fled from areas that were engulfed in the fighting. The (Portuguese) owners, managers, skilled technicians, and most of the migrant workforce abandoned the coffee estates. Destroyed bridges, land mines and roadblocks disrupted not only the transportation of coffee crops but also the resettlement of workers in areas that had previously been abandoned. Although Angola emerged as major oil economy during the 1970s, with control over oil fields becoming a strategic objective during the civil war, it was the armed conflict that ultimately devastated the coffee industry at a time when international prices remained highly favourable (Collelo 1989, pp.137-8). Yet, unlike Rwanda, where agricultural recovery remained a political priority, Angola's reliance on offshore oil revenues as primary source of state revenue diminished political incentives to promote the revival of commercial agriculture.

In Equatorial Guinea, cocoa was the country's leading export commodity, exporting annually on average 34,000 tons in 1965-9, constituting c. 75% of GDP (Frynas 2004). Long before oil became dominant in the late 1990s, the cocoa industry fell victim (i.e. 5,600 tons in 1979) to the predatory regime of Francisco Macías Nguema (1968-79). Extreme political repression was backed up with systematic violence and executions, leading not only to the exodus of Spanish plantation owners and skilled workers, but also to the exile of large numbers of Equatorial Guineans (Frynas 2004). The cocoa sector partly recovered after the fall of Nguema but remained fragile. After a second collapse in 1988-1993, this time initiated by ailing world market prices, the sector did not revive. As in Angola, Equatorial Guinea's discovery of oil and gas in the 1990s provided the ruling elite with access to substantial financial resources, weakening the government's incentives to revive the cash-crop sector.

The disruption of the flourishing coffee and cotton industries in Uganda under Idi Amin (1971-79) presents another clear case of state-induced violence and displacement. It is hard to disentangle the impact of the violence on collapsing coffee and cotton exports from the economic malaise that resulted from political disorder. Hyperinflation made the purchase of farm-inputs as well as off-farm transport and processing of crops unaffordable. Once considered a showcase of African-led export growth, Ugandan cotton exports plummeted from 78,200 to 3,500 tons over the 1970s. This collapse was further aggravated by the expulsion of the Asian settler community who controlled the cotton-ginning industry and linked Ugandan cotton growers to international markets (Jamal 1976; De Haas 2021). The collapse occurred during a period of stable cotton prices and booming coffee prices. Only in the 1980s, after Amin was ousted, did both crops experience a sharp price decline. While coffee revived, cotton never bounced back, probably due to the destruction of the necessary marketing infrastructure and the low margins in cotton value chains demanding considerable scale to break even.

Table 2: 32 cases of agricultural export collapse in crop-exporting and mineral-exporting countries, 1966-2020

Country	Crop	Period of collapse	% loss of export volume	World market (WM) price trend	Pre-collapse % share of total exports	Recovery rate: export volume 2016-20 / pre-collapse	Main cause(s)
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>
Crop exporters							
Benin	cotton	1974-1979	51%	unfavourable	17%	25	Fiscal squeeze or divestment
Gambia	groundnuts	1983-1987	75%	stable	69%	0.06	Fiscal squeeze or divestment + ecological shock
Ghana	cocoa	1976-1984	56%	favourable	60%	1.87	Fiscal squeeze or divestment
Ethiopia	coffee	1989-1992	47%	bust	63%	2.65	War, violence & displacement + WM price response + fiscal squeeze
Madagascar	vanilla	2007-2012	63%	bust	11%	1.23	WM price response
Rwanda	coffee	1993-1994	95%	recovering	68%	0.62	War, violence & displacement
Rwanda	tea	1993-1995	78%	stable	17%	2.9	War, violence & displacement
Uganda	coffee	1972-1977	41%	boom	53%	1.76	War, violence & displacement
Uganda	cotton	1972-1981	98%	favourable	19%	0.44	War, violence & displacement
Senegal	groundnuts	1977-1981	89%	unfavourable	48%	0.43	Fiscal squeeze or divestment
Senegal	groundnuts	2001-2008	88%	stable	12%	1.35	Fiscal squeeze or divestment
Tanzania	cotton	1981-1985	51%	bust	13%	1.27	WM price response + fiscal squeeze
Tanzania	cotton	1996-2000	52%	bust	20%	1	WM price response + fiscal squeeze
Tanzania	cashew	1974-1980	87%	favourable	5%	2.7	Fiscal squeeze or divestment
Togo	cotton	2003-2010	74%	stable	18%	1.01	Fiscal squeeze or divestment
Zimbabwe	tobacco	2001-2008	73%	stable	30%	0.85	Fiscal squeeze or divestment

Continuation of Table 2

Country	Commodity	Period of collapse	% loss in export volume	World market price conditions	Pre-collapse share of total exports	Recovery rate: export volume 2016-20 / pre-collapse	Main cause(s)
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>
Mineral exporters							
Angola	coffee	1975-1994	94%	favourable	33%	0.011	War, violence & displacement
CAR	coffee	1989-1992	55%	bust	30%	0.02	WM price response
CAR	cotton	1998-2003	94%	bust	14%	0.08	War, violence & displacement + WM price response
Chad	cotton	2006-2010	81%	stable	23%	0.16	Fiscal squeeze or divestment
DRC	coffee	1991-2001	95%	bust	8%	0.13	War, violence & displacement + WM price response
Equatorial Guinea	cocoa	1968-1976	86%	favourable	59%	0.03	War, violence & displacement
Equatorial Guinea	cocoa	1988-1993	64%	bust	58%	0.11	WM price response
Liberia	rubber	1989-1994	90%	unfavourable	19%	0.57	War, violence & displacement
Mozambique	cotton	1975-1980	85%	stable	17%	0.16	War, violence & displacement
Mozambique	tea	1980-1985	90%	favourable	6%	0.14	War, violence & displacement
Niger	groundnuts	1968-1974	100%	boom	55%	0.011	Ecological shock
Nigeria	groundnuts	1969-1977	100%	boom	21%	0.011	Oil-boom induced dutch disease + political divestment
Nigeria	oil-palm product	1966-1981	94%	favourable	15%	0.011	War, violence & displacement + Oil-boom induced dutch disease
Sierra Leone	coffee	1990-2001	93%	bust	12%	0.3	War, violence & displacement + WM price response
Sudan	cotton	1972-1981	63%	favourable	55%	0.57	Fiscal squeeze or divestment + ecological shock
Sudan	cotton	2003-2012	96%	stable	11%	1.2	Oil-boom induced dutch disease + political divestment

Sources: See Appendix Table 4.

Fiscal squeeze or divestment

Another frequent cause of agricultural export collapse in post-colonial Africa is the over-taxation of, or political divestment from, the farming sector. Conceptually, these phenomena are two sides of the same coin: either resource extraction through taxation undermines the capacity and incentives to invest in the sector, or the withdrawal of public funding erodes the infrastructure and services on which it depends. Fiscal squeezing, or state divestment, often operated in conjunction with state-induced violence, as exemplified by the predatory regimes of Nguema and Amin. Here, we identify fiscal squeezing as the main mechanism only where it occurred in the absence of large-scale violence. Table 2 lists 12 African country cases in which this played a leading role.

The fiscal squeeze typically arose from artificially increased margins between world market prices and fixed producer prices offered by state-backed monopsonistic marketing boards. A wide literature has discussed the over-taxation of the African peasantry in the context of a purported ‘urban bias’ in post-colonial African politics enabling a structural transfer of resources away from the countryside towards urban and public sectors (Lipton 1977; Bates 1981; Hesp 1985; Henley 2015). A telling example is the 1970s collapse of the cocoa sector in Ghana, for long the world’s leading cocoa producer. Austin (2023) explains in detail how the national cocoa marketing board sold the crop in USD, while buying it from local farmers at highly overvalued Ghanaian Cedi at official exchange rates. Domestic inflation and rising black-market exchange rates evaporated the profits cocoa farmers once reaped. Did farmers in the early 1960s still fetched c. 65% of the world market price, by the early 1980s their share had plummeted to c. 32% (Bulir 2002, p.418). In response, cocoa farmers either abandoned the crop and switched to food crops or off-farm jobs, or they smuggled their harvest across the border into Côte d’Ivoire where it fetched higher prices. In Ghana - and several other cases - overvalued exchange rates were not the result of mining-induced Dutch disease, but of ill-designed macro-economic policies that benefited a narrow political elite.

There were even more radical agricultural policies undermining the viability of agricultural exports. In Tanzania, for example, cashew nut exports vanished between 1974 and 1980, in the wake of the *Ujamaa* villagization scheme, a massive rural resettlement campaign executed under Nyerere.¹⁷ By 1977, it was estimated that c. 90% of the country’s 11 million inhabitants had been forced into planned village settlements (McHenry 1981, p.2). Whereas the cashew sector collapsed, cotton survived. Cotton is an annual and therefore relatively mobile crop, while cashew trees were much harder to sustain once farmers were forced to relocate. This, together with sharply declining rural incomes and rural-urban terms of trade as a result of marketing board price policies eroded the incentives of farmers to invest in cash-crops. Cotton output fell too, but much less dramatically, as the collapse of cashew may have cushioned the decline of cotton to some extent (Ellis 1982).

¹⁷ Ujamaa (literally “familyhood”) policies were launched in 1967 through the Arusha Declaration. At first (1967-72) people were encouraged to form cooperative villages on a voluntary basis, but in 1973 the program became compulsory and increasingly back-up with force.

The case of Zimbabwe's tobacco sector is also worth reviewing. Just before the launch of Zimbabwe's Fast Track Land Reform Programme, the tobacco sector peaked at a production level around 250,000 tons annually, earning about 30% of the country's export revenues. Starting in 2000, large commercial farms were expropriated and their land redistributed. Output collapsed as experienced growers left the country and credit, curing infrastructure, and marketing networks were disrupted. In 2008 the sector reached a trough, producing barley 20% of the pre-reform era. Hyperinflation, shortages of inputs, and the breakdown of agricultural finance compounded the effects of land reform. Yet, despite Zimbabwe's re-emerging mining sector, the prospect of mineral revenues compensating these losses were not great. The Mugabe regime thus opted to let Chinese tobacco corporations take over and engage in contract farming. These companies supplied seed, fertilizer, credit, technical advice, and guaranteed to purchases the tobacco from new smallholder farmers. As these smallholders gained experience, production rebounded and by the late 2010s, Zimbabwe had largely recovered its tobacco output, although the structure of the industry had fundamentally changed. Before 2000 it was dominated by a small number of large commercial farms, today it is led by over 100,000 smallholder growers producing under contract farming arrangements (Ngarava 2020; Shonhe et al. 2022).

Ecological shock

The impact of ecological shocks such as disease epidemics, droughts or floods on the collapse of African export crops appears limited. Groundnuts cultivated in more arid areas were the exception. In The Gambia, the groundnut sector collapsed in the aftermath of the Sahelian droughts of 1982-85, compounded by a worsening fiscal crisis. This marked the end of a roughly 150-year era during which groundnuts had been the country's leading export commodity (Swindell and Jeng 2006). In Niger, the first Sahelian drought stint (1968-72) led farmers to abandon groundnut cultivation too (Hamadou 2000). A distinct case, in which droughts played an indirect role, was the dwindling of cotton production in Sudan during the 1970s. This may seem surprising, since virtually all cotton was irrigated through the Gezira Scheme, which diverted water from the Blue Nile and therefore did not depend on rainfall. However, the failure of local food harvests prompted farmers and the government to re-allocate part of the irrigated land from cotton to food crops. At the same time, investments in irrigation infrastructure proved insufficient amid mounting debt and inflation, while the government's attempts to extract more tax revenue from the cotton sector reinforced the vicious cycle (Barnett 1977).

World market price bust

In 6 of the 32 cases a collapsing export sector can be directly linked to a steep fall in world market prices. The clearest example is the drop in Madagascar's vanilla exports from a record volume of 3,085 tons in 2007 to a mere 528 tons in 2012. Madagascar has long been one of the price setting exporters in the global vanilla market, and vanilla prices have been prone to

extreme peaks (often induced by hurricanes destroying vanilla plantations) followed by steep troughs as production capacity expands in response to such price booms (Khan et al. 2022). Cotton exports from Tanzania also plunged precisely in the wake of two price busts in the early 1980s and the late 1990s. In Equatorial Guinea, the long downhill slide of international cocoa prices from 1984 to 1993 dealt a death blow to an already weakened cocoa sector which had never fully recovered from its destruction during the Ngueme era.

Between 1986 and 1992 international coffee prices tumbled by more than 75%. This bust was caused by the dissolution of the International Coffee Agreement (ICA) in 1989, which allocated export quotas among producing countries to stabilize the market. After the ICA broke down, producers flooded the market with coffee. Even though the political situation in the CAR was never really stable, the coffee export collapse followed precisely in the wake of this bust. In Ethiopia, coffee exports also collapsed. In this case, however, the intensification of the civil war and the disintegration of the Derg regime, which had centralized coffee marketing, played the decisive role, as insecurity disrupted trade and deterred foreign buyers. As collection and transport networks deteriorated, coffee farmers withheld their harvest from official channels, smuggled coffee out of the country, or abandoned the crop altogether (IMF 1994). During the 1990s, coffee exports also collapsed in the DRC and Sierra Leone, with both losing more than 90% of their average export volumes of the 1980s. In these cases, the decline was also initiated by the price bust, but the civil wars in both countries were responsible for the collapse as such: at the conclusion of the First and Second Congo War (1996-2003) and Sierra Leone's civil war (1991-2002), and long after the bust of the late 1980s, there was almost nothing left of the sector.

Dutch disease

So what role is then left for a mining-induced Dutch disease type of explanation for declining crop exports? A surprisingly small one. Only in three of the 32 cases reported in Table 2 does the evidence point in this direction, two of which are located in the same country, Nigeria, and the other case is Sudan. In both cases an oil-boom drove the process of crowding-out. In Nigeria the oil-boom of the late 1960s to early 1980s drew resources away from the groundnut and palm oil industries, that struggled with a strong and appreciating national currency, which was only devaluated in the mid-1980s. In Sudan the oil-boom of 1999-2011 was driven by both favourable international oil prices and the completion of the export pipeline from the southern oil fields to Port Sudan. While cotton prices were relatively stable, the Sudanese Pound was shored up by rapidly expanding oil revenues, a boom period that ended with the 2011 secession of South Sudan (where most of the oil fields are located). But in the cases of Sudanese cotton as well as Nigerian palm oil, warfare also played a role. Exports of palm products were heavily affected by the Biafra War (1967-70), which was fought in the region where many of the palm plantations were located. While the irrigated cotton fields in Central Sudan were far away from the battlefields in Darfur (Western Sudan) and Southern Sudan, the Gezira scheme suffered from resources that were diverted to military operations and the Reform Act of 2005

decentralized credit and input distribution networks as well as irrigation maintenance without effective private organizations ready to assume these functions ([Maghoub 2014](#)).

Divergent paths of recovery

Neither international prices trends, nor mining-induced crowding-out mechanisms can explain the demise of many rural areas that had specialized, for longer or shorter periods of time, in the production and processing of the crops pivotal to Africa's cash-crop revolution. In most cases, agricultural exports collapsed due to outbreaks of large-scale violence or fiscal predation. Often, it was a combination of both, as the cost of military operations pressured incumbent regimes to divert economic resources (i.e. revenue, labour, capital, means of transportation), away from the wealthier rural areas. But also, without large-scale violence, counterproductive agricultural policies and urban policy bias incentivised farmers to abandon their export crops. This begs the question whether trade-offs between mineral and agricultural development existed at all? The answer is yes, but it comes with a twist: minerals impeded the revival of export agriculture *after* collapse.

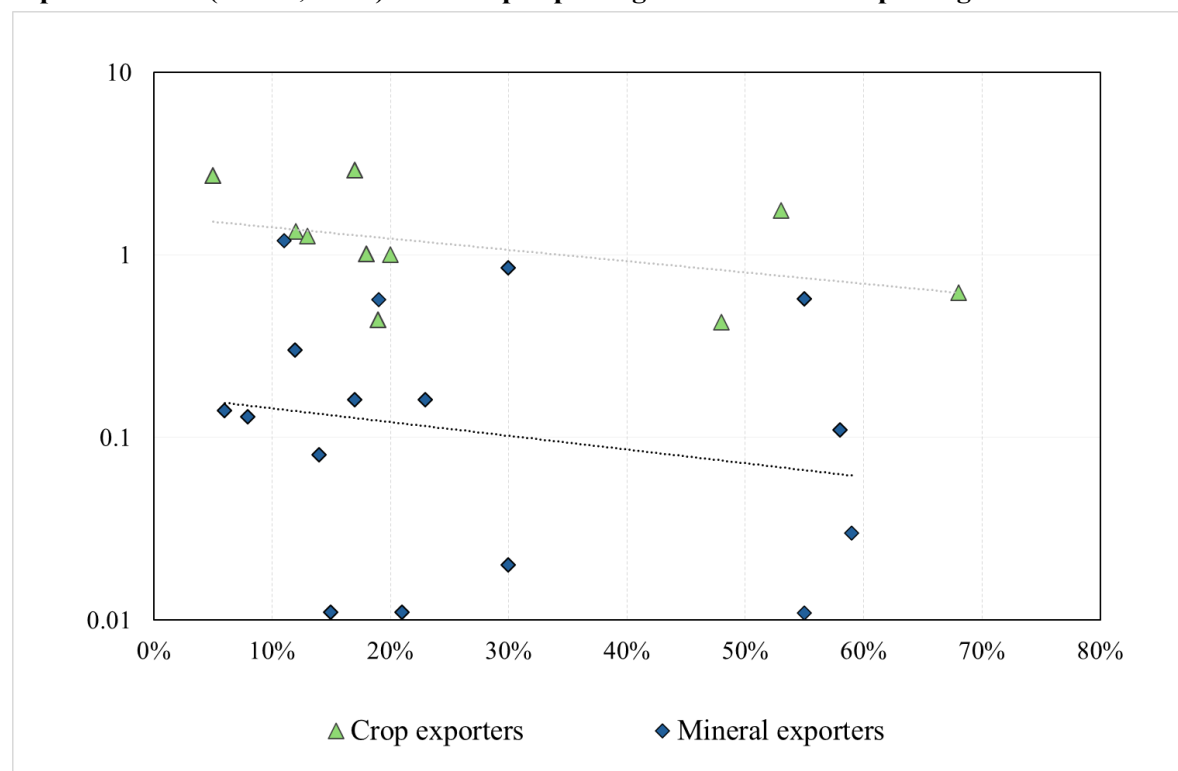
In Figure 9 we investigate the role the mineral export sector played in the recovery of agricultural exports. Figure 9 plots the percentage share of the 32 crops in total export revenues before collapse (x-axis) against their recovery rates (y-axis). We distinguish between crop-exporting and mineral-exporting countries by adopting the 50% threshold for the period 2000-2019. The scatterplot reveals a striking difference between both groups. Whereas the likelihood that the crop export sector fully recovers after a collapse is about 69% in economies *without* a mining sector of any significance, that same probability is just 6% in economies with a substantial mining industry. Another way of expressing the big contrast between both groups is to look at the unweighted average rate of recovery: 2.8 versus 0.22.

While the correlation is strong, it is useful to consider a few outliers and ask in how far these are exceptions that prove the rule? The Gambia is the only crop-exporting economy that thus far failed to revive its longstanding tradition in groundnut production. In the decade before the start of its collapse (1973-82) groundnuts still accounted for 69% of total exports. The demise occurred in stages. After a plunge from 60,000 tons in 1982 to barely 11,000 tons in 1991, the sector recovered a little during the 1990s, with export volumes back to c. 21,000 tons in 2001. Yet, in 2019, there were only 74 tons of export recorded. Gambia's GDP per capita remained stagnant for almost 40 years in row, just below 700 USD (in 2015 constant prices) ([World Bank 2026](#)).

Attempts to rescue the sector were undertaken. In the early 1990s the government's monopoly through the, by then insolvent, Gambia Produce Marketing Board was abolished as part of structural adjustment programmes. In 1993, the marketing board was privatized into the Gambia Groundnut Corporation ([WTO 2004, p.60](#)). The reform removed subsidized credit, extension services, and much of the state's role in organizing procurement. While intended to increase efficiency, it did not solve the issue was ailing processing facilities and poor marketing services for most smallholders, who increasingly diverted their crop across the border to

Senegal. With ca. 2.4 million inhabitants in 2020, The Gambia is a very small economy. Today, tourism brings in the necessary foreign reserves.

Figure 9: Post-collapse recovery rate (Y-axis; log-scale) versus pre-collapse crop share in total export revenue (X-axis; in %) in 16 crop exporting and 16 mineral exporting economies



Source: ACTD 2.0.

Sudan is another outlier in Figure 9. It experienced a 96% loss in the volume of its cotton exports between 2003-12, but by 2016-20 exports exceeded the levels before 2003 by c. 20%, which is out of line with the patterns observed in other mineral economies. However, with the separation of South Sudan in 2011, the North lost access to about three-quarters of the oil production. The Sudanese government thus faced clear incentives not to bet on future oil revenues, but to re-invest resources in the cotton sector. In the face of the new civil war that broke out in April 2023, the resurgence of the cotton export sector may have proved to be short-lived. Yet, the case of Sudanese cotton does present us with an exception that supports the rule: crowding out mechanisms, such as political divestment, operate especially when governments count on minerals as a stable future source of revenue.

7. Conclusion

Using the newly created African Commodity Trade Database (ACTD 2.0), this paper presents three main findings. First, we have shown that mining and commercial agriculture expanded in

parallel for much of the 20th century. A decisive shift toward mineral export specialization occurred after 1970, when the terms of trade for oil and gas began to diverge sharply from those of tropical cash crops. This first price scissor was followed after 1998 by a second price scissor that emerged between crops and other minerals. During this second price scissor, the long-run pattern of parallel expansion and decline across crops and mineral exports broke down.

Second, the sharp divergence in price trends challenges the notion that primary commodities are subject to long-run downward price pressure, driven by unlimited labour supplies that generate strong supply-responses when global demand expands. With the benefit of hindsight, this theory, posited by Angus Deaton, appears to hold for crops but is difficult to maintain for minerals. Despite the entry of millions of Africans into artisanal and small-scale mining since the early 2000s, suggesting a strong supply response, output growth has not been sufficient to drive prices down.

Third, this paper challenges conventional interpretations of declining export agriculture because of either international price developments or resource curse mechanisms. We have shown that the collapse of African crop exports cannot be attributed primarily to Dutch disease or direct crowding-out effects from expanding mining sectors. Instead, the historical record indicates that political violence and fiscal predation were the principal drivers of agricultural export collapse. Moreover, agricultural exports often collapsed despite favourable world market prices. The mineral transition affected export agriculture in a different way. Where significant mining sectors emerged, they weakened the (interrelated) incentives of both governments and private investors *to restore the infrastructures underpinning export agriculture after its collapse*. The probability of a full recovery of crop exports (in terms of export volume) was only 6% among mineral exporters, compared with 69% among economies without significant mining industries. The mineral transition thus shaped post-crisis recovery trajectories rather than initiating agricultural decline itself.

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APPENDIX

Appendix Table 1: Total export to GDP ratio (current USD)

	1960	1990	2020
Angola		0.35	0.43
Benin	0.04	0.06	0.05
Botswana	0.25	0.47	0.29
Burkina Faso	0.01	0.05	0.25
Burundi	0.04	0.07	0.06
Cameroon	0.16	0.17	0.08
Central African	0.12	0.08	0.02
Chad	0.04	0.11	0.18
Congo, D. Rep.		0.25	0.29
Congo, Rep.	0.14	0.35	0.43
Cote d'Ivoire	0.28	0.28	0.20
Equatorial Guinea		0.55	0.30
Eswatini	0.48	0.50	0.44
Ethiopia	0.05	0.02	0.02
Gabon	0.33	0.37	0.48
Gambia		0.10	0.01
Ghana	0.24	0.15	0.21
Guinea		0.17	0.63
Guinea-Bissau		0.03	0.14
Kenya	0.12	0.12	0.06
Lesotho	0.11	0.10	0.41
Liberia	0.43	0.95	0.19
Madagascar	0.11	0.08	0.15
Malawi		0.15	0.06
Mali		0.12	0.21
Mauritania		0.31	0.34
Mauritius	0.00	0.45	0.14
Mozambique		0.03	0.24
Namibia		0.39	0.53
Niger	0.03	0.08	0.05
Nigeria	0.11	0.25	0.08
Rwanda	0.03	0.05	0.14
Senegal	0.11	0.11	0.16
Sierra Leone	0.23	0.21	0.10
South Africa	0.12	0.19	0.25
Sudan	0.16	0.01	0.14
Tanzania	0.06	0.05	0.09
Togo	0.09	0.12	0.13
Uganda	0.30	0.04	0.11
Zambia	0.40	0.40	0.43
Zimbabwe	0.16	0.20	0.20
Average	0.16	0.21	0.21

Source: Exports from ACTD 2.0; GDP data from [World Bank \(2026\)](#).

Appendix Table 2a: African countries classified as mineral exporters and oil exporters over the 50% threshold, 1950-2019

	1950-59	1960-69	1970-79	1980-89	1990-99	2000-09	2010-19
	<i>Zambia</i>	<i>Zambia</i>	<i>Zambia</i>	<i>Zambia</i>	<i>Zambia</i>	<i>Zambia</i>	<i>Zambia</i>
	<i>Sierra Leone</i>	<i>Sierra Leone</i>	<i>Sierra Leone</i>	<i>Guinea</i>	<i>Sierra Leone</i>	<i>Sierra Leone</i>	<i>Sierra Leone</i>
	<i>Guinea</i>	<i>Guinea</i>	<i>Guinea</i>	<i>Niger</i>	<i>Guinea</i>	<i>Guinea</i>	<i>Guinea</i>
	<i>South Africa</i>	<i>Mauritania</i>	<i>Namibia</i>	<i>Botswana</i>	<i>Botswana</i>	<i>Congo, Rep.</i>	<i>Namibia</i>
	<i>Namibia</i>	<i>Namibia</i>	<i>Liberia</i>	<i>Namibia</i>	<i>Namibia</i>	<i>Mauritania</i>	<i>Congo, DR</i>
	<i>Congo, DR</i>	<i>Congo, DR</i>	<i>Mauritania</i>	<i>Sierra Leone</i>	<i>Congo, DR</i>	<i>Botswana</i>	<i>Niger</i>
		<i>Liberia</i>	<i>Congo, DR</i>	<i>Liberia</i>	<i>Niger</i>	<i>Mali</i>	<i>Botswana</i>
			<i>Niger</i>	<i>Mauritania</i>	<i>CAR</i>	<i>South Africa</i>	<i>Mali</i>
		Libya	<i>Tunisia</i>	<i>Tunisia</i>		<i>Niger</i>	<i>Ghana</i>
		Algeria			Algeria	<i>Mozambique</i>	<i>Liberia</i>
			Algeria	Algeria	Libya	<i>CAR</i>	<i>Mauritania</i>
			Libya	Libya	Gabon		<i>Mozambique</i>
			Gabon	Gabon	Nigeria	Algeria	<i>CAR</i>
			Nigeria	Nigeria	Angola	Libya	<i>Burkina Faso</i>
			Congo, Rep.	Angola	Congo, Rep.	Gabon	<i>Eritrea</i>
			Angola	Congo, Rep.	Eq. Guinea	Nigeria	
				Egypt	Egypt	Angola	Algeria
						Congo, Rep.	Libya
						Eq. Guinea	Nigeria
						Chad	Angola
						Sudan	Congo, Rep.
							Eq. Guinea
							Chad
							Sudan
							S. Sudan
							Gabon
Total SSA (ex. SA) > 50%	5	6	11	11	12	16	22
Total Africa > 50%	6	8	14	15	15	19	24

Source: ACTD 2.0; Notes: non-oil mineral exporters = *italics*, oil exporters = **bold**.

Appendix Table 2b: African countries classified as mineral exporters and oil exporters over the 66% threshold, 1950-2019

	1950-59	1960-69	1970-79	1980-89	1990-99	2000-09	2010-19
	<i>Zambia</i>	<i>Zambia</i>	<i>Zambia</i>	<i>Zambia</i>	<i>Zambia</i>	<i>Zambia</i>	<i>Zambia</i>
	<i>Sierra Leone</i>	<i>Sierra Leone</i>	<i>Sierra Leone</i>	<i>Guinea</i>	<i>Sierra Leone</i>	<i>Sierra Leone</i>	<i>Sierra Leone</i>
	<i>Guinea</i>	<i>Guinea</i>	<i>Guinea</i>	<i>Niger</i>	<i>Guinea</i>	<i>Guinea</i>	<i>Guinea</i>
	<i>South Africa</i>	<i>Mauritania</i>	<i>Namibia</i>	<i>Botswana</i>	<i>Botswana</i>	<i>Congo, Rep.</i>	<i>Namibia</i>
	<i>Namibia</i>	<i>Namibia</i>	<i>Liberia</i>	<i>Namibia</i>	<i>Namibia</i>	<i>Mauritania</i>	<i>Congo, DR</i>
	<i>Congo, DR</i>	<i>Congo, DR</i>	<i>Mauritania</i>	<i>Sierra Leone</i>	<i>Congo, DR</i>	<i>Botswana</i>	<i>Niger</i>
		<i>Liberia</i>	<i>Congo, DR</i>	<i>Liberia</i>	<i>Niger</i>	<i>Mali</i>	<i>Botswana</i>
			<i>Niger</i>	<i>Mauritania</i>	<i>CAR</i>	<i>South Africa</i>	<i>Mali</i>
		Libya	<i>Tunisia</i>	<i>Tunisia</i>		<i>Niger</i>	<i>Ghana</i>
		Algeria			Algeria	<i>Mozambique</i>	<i>Liberia</i>
			Algeria	Algeria	Libya	<i>CAR</i>	<i>Mauritania</i>
			Libya	Libya	Gabon		<i>Mozambique</i>
			Gabon	Gabon	Nigeria	Algeria	<i>CAR</i>
			Nigeria	Nigeria	Angola	Libya	<i>Burkina Faso</i>
			Congo, Rep.	Angola	Congo, Rep.	Gabon	<i>Eritrea</i>
			Angola	Congo, Rep.	Eq. Guinea	Nigeria	
				Egypt	Egypt	Angola	Algeria
						Congo, Rep.	Libya
						Eq. Guinea	Nigeria
						Chad	Angola
						Sudan	Congo, Rep.
							Eq. Guinea
							Chad
							Sudan
							S. Sudan
							Gabon
Total SSA (ex. SA) > 66%	3	3	8	8	9	13	16
Total Africa > 66%	3	5	11	10	11	16	18

Source: ACTD 2.0; Notes: non-oil mineral exporters = *italics*, oil exporters = **bold**, countries between 50-66% = grey.

Appendix Table 2c: African countries classified as mineral exporters and oil exporters over the 33% threshold, 1950-2019

	1950-59	1960-69	1970-79	1980-89	1990-99	2000-09	2010-19
	<i>Zambia</i>	<i>Zambia</i>	<i>Zambia</i>	<i>Zambia</i>	<i>Zambia</i>	<i>Zambia</i>	<i>Zambia</i>
	<i>Sierra Leone</i>	<i>Sierra Leone</i>	<i>Sierra Leone</i>	<i>Guinea</i>	<i>Sierra Leone</i>	<i>Sierra Leone</i>	<i>Sierra Leone</i>
	<i>Guinea</i>	<i>Guinea</i>	<i>Guinea</i>	<i>Niger</i>	<i>Guinea</i>	<i>Guinea</i>	<i>Guinea</i>
	<i>South Africa</i>	<i>Mauritania</i>	<i>Namibia</i>	<i>Botswana</i>	<i>Botswana</i>	<i>Congo, Rep.</i>	<i>Namibia</i>
	<i>Namibia</i>	<i>Namibia</i>	<i>Liberia</i>	<i>Namibia</i>	<i>Namibia</i>	<i>Mauritania</i>	<i>Congo, DR</i>
	<i>Congo, DR</i>	<i>Congo, DR</i>	<i>Mauritania</i>	<i>Sierra Leone</i>	<i>Congo, DR</i>	<i>Botswana</i>	<i>Niger</i>
	<i>Zimbabwe</i>	<i>Liberia</i>	<i>Congo, DR</i>	<i>Liberia</i>	<i>Niger</i>	<i>Mali</i>	<i>Botswana</i>
	<i>Morocco</i>	<i>Tunisia</i>	<i>Niger</i>	<i>Mauritania</i>	<i>CAR</i>	<i>South Africa</i>	<i>Mali</i>
		<i>CAR</i>	<i>Tunisia</i>	<i>Tunisia</i>	<i>Liberia</i>	<i>Niger</i>	<i>Ghana</i>
		<i>Morocco</i>	<i>Botswana</i>	<i>South Africa</i>	<i>Mauritania</i>	<i>Mozambique</i>	<i>Liberia</i>
		<i>South Africa</i>	<i>Togo</i>	<i>Congo, DR</i>	<i>Ghana</i>	<i>CAR</i>	<i>Mauritania</i>
			<i>Zimbabwe</i>	<i>Ghana</i>	<i>Togo</i>	<i>Ghana</i>	<i>Mozambique</i>
		Libya	<i>Morocco</i>	<i>Togo</i>	<i>Cameroon</i>	<i>Namibia</i>	<i>CAR</i>
		Algeria	<i>South Africa</i>	<i>CAR</i>		<i>Cameroon</i>	<i>Burkina Faso</i>
		Gabon		<i>Morocco</i>	Algeria		<i>Eritrea</i>
			Algeria		Libya	Algeria	<i>South Africa</i>
			Libya	Algeria	Gabon	Libya	<i>Cameroon</i>
			Gabon	Libya	Nigeria	Gabon	<i>Zimbabwe</i>
			Nigeria	Gabon	Angola	Nigeria	<i>Tanzania</i>
			Congo, Rep.	Nigeria	Congo, Rep.	Angola	
			Angola	Angola	Eq. Guinea	Congo, Rep.	Algeria
				Congo, Rep.	Egypt	Eq. Guinea	Libya
				Egypt		Chad	Nigeria
						Sudan	Angola
						Egypt	Congo, Rep.
							Eq. Guinea
							Chad
							Sudan
							S. Sudan
							Gabon
Total SSA (ex. SA) > 33%	6	8	11	11	12	16	22
Total Africa > 33%	8	14	20	22	21	24	29

Source: ACTD 2.0; Notes: non-oil mineral exporters = *italics*, oil exporters = **bold**, countries between 33-50% = grey.

Appendix Table 3: Sources of international price series of individual commodities, 1850-2020

	1850-1900	1900-1960	1960-2020
Manufacturing composite	n.a.	G&Y	WB
Energy			
Oil (crude, brent)	BP	BP	BP
Natural gas	n.a.	n.a.	WB
Tropical export crops			
Palm oil	Sb	Sb; G&Y	WB
Cotton	Sb	G&Y	WB
Cocoa	n.a.	G&Y	WB
Coffee	Sb	G&Y	WB
Rubber	n.a.	G&Y	WB
Sugar	Sb	G&Y	WB
Tea	n.a.	G&Y	WB
Tobacco	n.a.	G&Y	WB
Minerals			
Aluminium	n.a.	G&Y	WB
Iron	n.a.	n.a.	WB
Copper	Sb	G&Y	WB
Phosphate	n.a.	n.a.	WB
Tin	n.a.	G&Y	WB
Zinc	n.a.	n.a.	WB
Gold	O&W	G&Y	WB
Silver	n.a.	G&Y	WB
Food crops & meat			
Wheat	Sb	G&Y	WB
Rice (Thai 5%)	Sb	Sb; G&Y	WB
Maize	Sb	G&Y	WB
Sorghum	n.a.	n.a.	WB
Barley	n.a.	n.a.	WB
Soybeans	n.a.	n.a.	WB
Beef	n.a.	n.a.	WB
Chicken meat	n.a.	n.a.	WB

Note: WB = World Bank; BP = BP Statistical review of world energy; G&Y = Grilli and Yang; Sb = Sauerbeck; O&W = Officer and Williamson.

Individual commodity price series

The international price series of individual commodities have been constructed on the basis of three historical datasets. For 1960-2020 we used the annual indices of nominal prices of the World Bank *Commodity Price Database* (The Pink Sheet, v. Sept. 05, 2023). We extrapolated these series back to 1900 using the index series constructed by Grilli and Yang (1988). To trace these series back to 1850 we used the series published by Sauerbeck which were published in various issues of the *Journal of the Royal Statistical Society*, specifically vol. 49:3; vol. 56:2; vol. 63:1; vol. 68:1; vol. 80:2; vol. 95:2 and vol. 114:3. All series were subsequently deflated with the US consumer price index by Officer and Williamson (2024b). For manufacturing the World Bank and Grilli and Yang both offer a composite price index which we adopted. For crude oil we used a price series for 1861-2020 from the *BP Statistical Review of World Energy*.

For gold we used gold prices quoted in the New York market, which are included in the database by Officer and Williamson (2024a) *The Price of Gold, 1257 – Present*. Since the Sauerbeck series run up to 1950 for most commodities, we were able to check the trends between Grilli and Yang and Sauerbeck for mutual consistency. In most cases the series reveal near perfect overlap, but in the case of rice and palm oil we opted for the Sauerbeck series for the period 1900-1950, switching to Grilli and Yang for 1950-1960. To avoid large statistical shifts due to the connection of different historical price series, we also checked for major price disruptions surrounding the connection years 1960 and 1900. We did not detect major problems here. The table below offers an overview of the sources we used for each commodity for the three main time periods.

Composite price series

The composite price series are based on a selection of individual commodity price series which are informed by a) the relative importance of the commodity in global trade, and b) the availability of a consistent long-term price series. The composite indices are unweighted and include the following commodities.

1. Tropical export crops: palm oil, cotton, coffee and sugar
2. Food crops: rice, wheat and maize
3. Minerals: oil, copper, gold and aluminium
4. Manufacturing: based on a large basket of industrial products selected by the World Bank.

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Appendix Table 4: Sources used to classify causes of crop export collapse per country

Crop exporters	
Benin:	Gergely 2009; Fok & Tazi 2003; World Bank 1979
The Gambia:	Bojang 2021; Diop et al. 2004; IFPRI 2007; WTO 2004
Ghana:	Austin 2023; Bulir 2002
Ethiopia:	IMF 2004; Krivonos 2004
Madagascar:	Cadot et al. 2006; Khan et al. 2021; Zhu 2018
Rwanda:	André & Platteau 1998; Desforges 1999; Verwimp 2003
Uganda:	Baffes 2009; De Haas 2021; Jamal 1976
Senegal:	Delgado and Jammeh 1991; Diop et al. 2004; IMF 2002
Tanzania:	Baffes 2004; Ellis 1982; Green et al. 1980; McHenry 1981; Poulton & Maro 2009
Togo:	Baffes 2009b; World Bank 2010b
Mineral exporters	
Angola:	Collelo 1989; Hodges 2003
CAR:	Gafsi & Mbetid-Bessane 2002; Lombard 2016
Chad:	Loening 2010
DRC:	Bokopo et al. 2024; Kalonji-Mbuyi et al. 2010
Equatorial Guinea:	Frynas 2004
Liberia:	Ellis 1999; Gough 2019
Mozambique:	Boughton et al. 2003; Norfolk et al. 2003
Niger:	Mortimore et al. 2001; Hamadou 2000
Nigeria:	Collins 1976; Dada 2007; Forrest 1995; Idachaba & Ayoola 1991; Kajisha et al. 1997; Watts 1987
Sierra Leone:	Amara et al. 2014; IF 2006
Sudan:	Barnett 1977; Mahgoub 2014; World Bank 2010a; Yousif 2015
Zimbabwe:	Ngarava 2020; Shonhe et al. 2022

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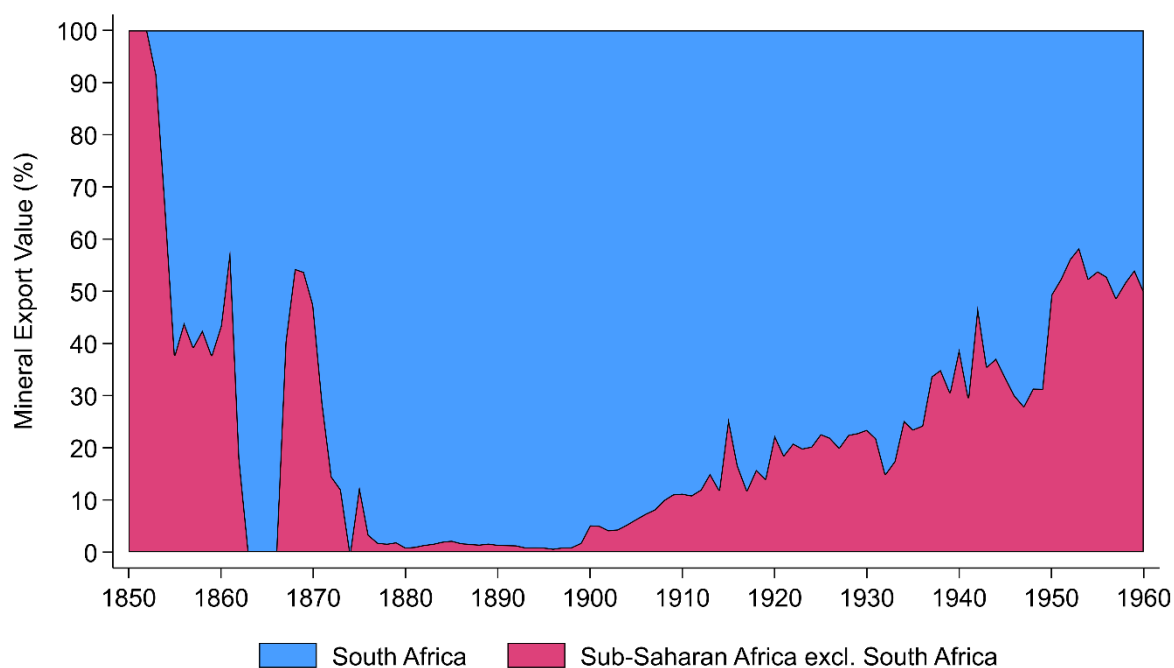
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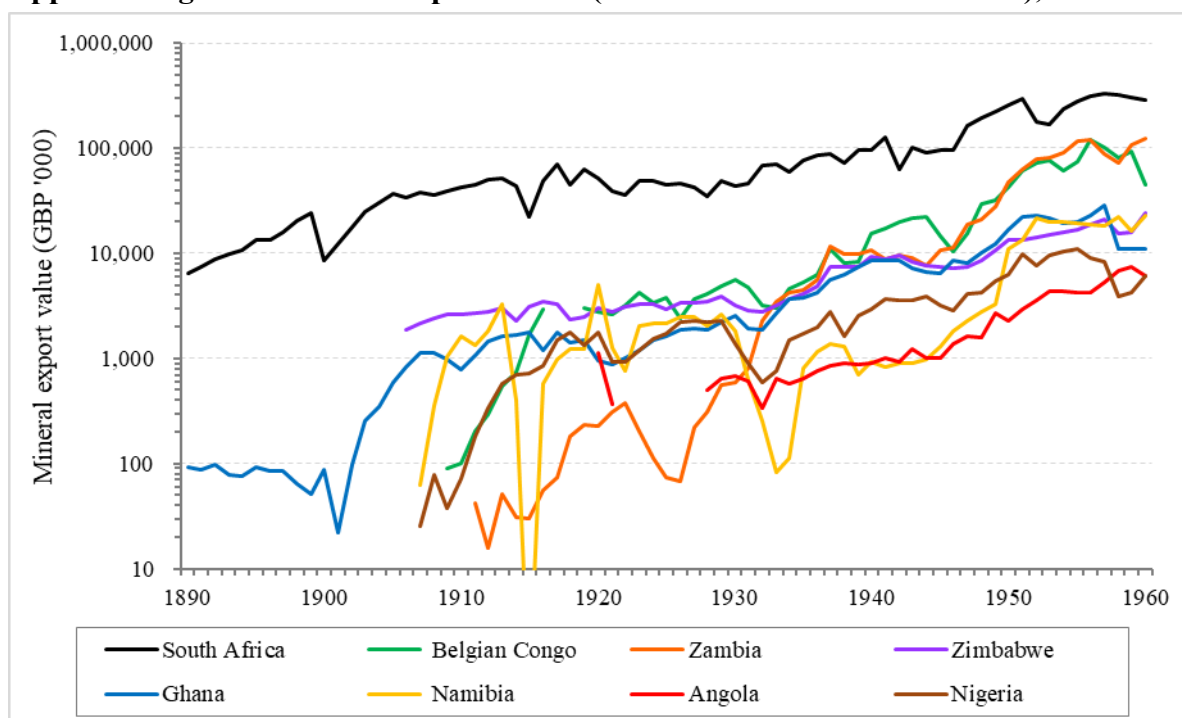
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Appendix Figure 1: South Africa's share of Sub-Saharan African mineral exports (in % of total value), 1850-1960



Source: ACTD 2.0.

Appendix Figure 2: Mineral export values (in current 1000 British Pounds), 1890-1960



Source: ACTD 2.0.