

Exogenous shocks and commodity dependence: how diversification can fuel Africa's green economy

Policy Paper

Abstract

A diversified set of exported goods is one indicator that an economy has transitioned from concentration on a narrow basket of primary commodities to higher-value and more resilient industries and services. This process of economic transformation is high on Africa's policy agenda, and links closely with a shift to a green economy harnessing renewable energy and producing new goods for the global green transition. From 2018-2020, Africa witnessed a notable decrease in its export concentration index, which traditionally could be a good sign of this transformation. This paper examines whether this transformation was indeed the force behind the fall in export concentration. It finds that the impacts of the COVID19 pandemic on some traditional exports, and the rising value of gold exports in particular, have driven many visible trade trends, speaking more to continued commodity dependence rather than transformation. Yet these trends also shed light on many links between the region's current dependence, and implementable policies to spur green commodity-based value addition in upstream and downstream industries.

I. Introduction

Industrialization and economic diversification have been priority areas for policy makers in Africa ever since independence. Countries seek to diversify away from raw commodities, characterized by limited returns and vulnerability to global price swings, and invest in higher value-added activities that generate greater export and foreign exchange earnings, revenues, and more secure and high-wage employment, leading to a structural transformation of the economy. To date, Africa has had a mixed record with these aspirations. While some countries and firms have emerged as global leaders, many remain dependent on a basket of lower-value agricultural, fossil fuel and mineral products to drive growth, with primary un-processed commodities still accounting for 70 per cent of the region's export basket (ECA 2021b). This is evident in measures such as the Herfindahl-Hirschman Index of market concentration or diversification, which when applied to trade flows, reveals a higher concentration in Africa regionally and in country case-studies as compared with other comparative regions and economies (UNCTAD Stat 2023).

Meanwhile, countries have increasingly linked their policy aims and objectives with parallel goals for broader and inclusive and sustainable socioeconomic development. This has involved onboarding tenets of both the global 2030 Agenda for Sustainable Development, and the regional Agenda 2063 of the African Union. While the region accounts for less than three per cent of global greenhouse gas emissions, it is particularly vulnerable to the impacts of climate change, through more severe and prolonged droughts, storms, changing sea levels and other climatic events (ECA 2021b). Thus it is in the region's collective interest to seek greener means to grow and industrialize, and pursuing the difficult but necessary twin aims of protecting local environments while improving livelihoods in communities holding significant natural resources. There are immense opportunities to link this green agenda with the ultimate objective of structural transformation, with booming demand for products for the green economy – such as materials for clean energy production and storage – that rely on African inputs. Moving into higher segments of value chains for these products is therefore an imperative. The African Continental Free-Trade Area (AfCFTA) provides a further opportunity to unlock intra-African trade, which is more diversified and based on industrial goods than the continent's exports with external partners (ECA 2016).

The direct and indirect impacts of the COVID19 pandemic have derailed much progress made towards sustainable development and transformation, both globally and in Africa. The impacts are ubiquitous, across indicators of health, economic performance, poverty, and environmental protection. Some impacts, including on export diversification and concentration, are very significant, and reveal much about structural strengths and weaknesses prior to the pandemic.

This paper seeks to examine the marked impacts of the pandemic on indicators for export diversification, to examine if specific diversification or concentration of Africa's exports has occurred, and if so, what has been driving this. The implications for the region's economic and climate goals are clear in furthering the work and literature on what can incentivize diversification and transformation across the continent.

The paper is structured as follows. Section II examines the impact of COVID on the sustainable development paradigm in Africa. Section III introduces the role of industry and trade in Africa's green agenda. Section IV reveals the methodology used in this analysis. Section V presents and analyses data on export concentration. Section VI discussed these findings, particularly regarding commodity dependence. Section VII explores policy options for harnessing these trends to instil sustainable development and transformation. Section VIII concludes.

II. Impact of COVID on Africa's sustainable development

The severe impacts of the COVID-19 pandemic were felt across all corners of the world, and all sectors of the global economy. Africa was no different, with subsequent short-term effects of the pandemic and lockdown, and long-term effects that reverberated across supply chains, commodity markets and beyond. ECA (2021a) estimates that Africa's GDP contracted by 3.2 per cent in 2020 due to COVID-19, and that it may take until 2024 to restore the continent's fiscal deficits to pre-pandemic levels, an aspiration which is still subject to ongoing global uncertainties and financial availability. A major transmission channel has been through global economic activity and trade, with WTO (2021) measuring a 9.6 per cent fall in the trade of goods and services in 2020, nearly three times larger than the contraction in global GDP. Yet this trade also experienced a strong rebound in 2021, particularly for merchandise trade and in countries with strong trade linkages and fewer COVID19 cases. These events reflect how growing interconnectivity of global supply chains make the world both more vulnerable to the contagion effects of shocks, but also more resilient to such shocks once they occur, with substantial implications for global supply chains.

Tourism was a major sector through which African exports, foreign exchange, incomes and livelihoods were impacted – indeed before the pandemic tourism and hospitality accounted for 8.5 per cent of GDP, 6.7 per cent of employment and 30 per cent of services exports in 2018 (WTO 2021), but this high dependence and the complete shutdown in global travel led to an 11.5 per cent drop in growth in tourism-dependent countries in Africa in 2020 (AfDB 2021).

Regarding the wide socioeconomic impacts of COVID-19, ECA (2021) found that an estimated 55 million Africans were pushed into poverty by the pandemic, reversing more than two decades of progress in reducing poverty. This has affected women and girls in particular, with a higher proportion of women stopping work due to COVID across many African case study countries (AfDB 2021). AfDB has constructed an Economic Vulnerability Index which reveals that 31 African countries are considered vulnerable, while noting that addressing export concentration is one means to improve countries' abilities to absorb shocks.

Meanwhile, the pandemic has significantly affected the continent's trajectory towards its sustainable development targets, as measured by the 2030 Agenda and Agenda 2063. Before 2020 the region was already not on track to achieve these targets due to combined effects of slow growth, limited fiscal space, and the impacts of climate change – climate events had already impacted African economies by between 3-5 per cent of GDP on average (ECA 2021b). For example, sea levels are rising in Africa at 2mm more per year than the global average, and Africa lost two percentage points of forest cover in 2000-15, versus a 0.5 percentage point loss globally (WMO 2019; ECA 2016). None of the 17 goals had reached the interim progress envisioned by 2019, and in fact SDGs 10, 13 and 16 had witnessed reversals (ECA 2022). To this, COVID and the conflict in Ukraine have added a new host of vulnerabilities, including rising food and fuel prices, expanded social and human spending needs alongside limited fiscal space, increased indebtedness and vulnerability to global interest rate hikes.

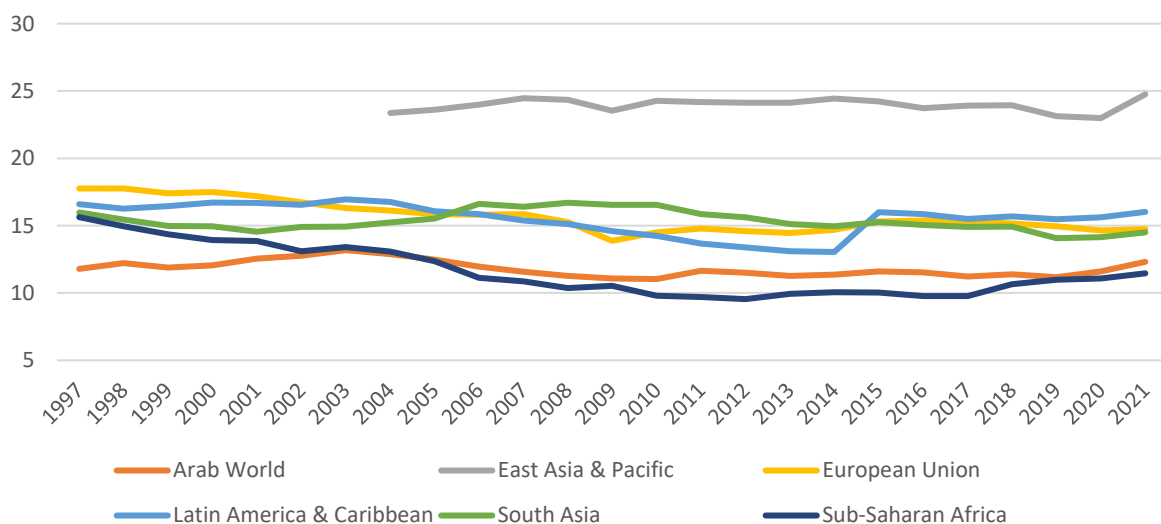
III. Role of industry, natural resources and trade in Africa's green agenda

These economic and financial constraints have consequences for investments in the green economy in Africa, which are needed to scale-up new activities, boost productivity, create jobs and ensure natural capital sustainability (ECA 2021b). Green infrastructure can have particularly large income and employment multipliers, with estimates that clean-energy infrastructure can create twice as many jobs per dollar as fossil-fuel investments (ibid). Batini and others (2021) estimate that multipliers from

green spending are 2 to 7 times larger than from non-eco-friendly spending, depending on the sector. Many specific examples exist, such as estimates by O’Callaghan and others (2021) that if DRC incorporates green initiatives into its COVID-19 recovery, this could yield 130 per cent more jobs and 280 per cent more economic output than traditional investments.

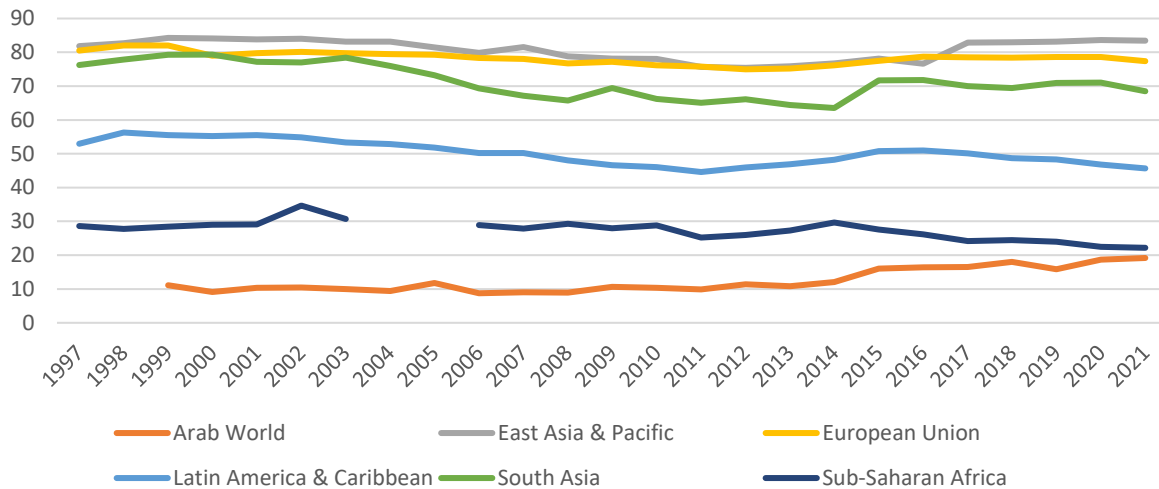
Industrialization has long been at the top of African policy makers’ agenda to drive the continent towards a structural transformation of diversified economies and higher incomes. New industries are key to absorb labour market entrants, produce a variety of goods with higher market prices and which are less concentrated and subject to global price swings, ultimately generating more foreign exchange and taxable earnings to reinvest in a virtuous cycle of transformation – a process witnessed in all global industrializers (Rodrik 2011, Sloan 2020). As indicated in Figures 1 and 2, regions such as East Asia and the Pacific have maintained high proportions of manufacturing value added (MVA) as a per cent of GDP, and along with the EU and South Asia also high proportions of manufactures exports in their total exports. Meanwhile, Africa features a notably lower level of MVA as a per cent of merchandise exports. These are two indicators of large and developed manufacturing sectors. Here we focus on manufacturing in particular, as broader data on industry captures raw and primary extractive activities such as oil and mining, which do not reflect the diversification and value-addition sought.

Manufacturing, Value Added (% of GDP)



Source: Authors’ Calculations based on World Development Indicators (2023)

Figure 2: Manufactures Exports (% of merchandise exports)



Source: Authors' Calculations based on World Development Indicators (2023)

*gaps in graph due to data gaps

Hesse (2008) observes that this process of diversification is particularly crucial for developing economies. Prebisch (1950), Dos Santos (1970), Frank and others have long noted the need for countries in the Global South to build new competitive advantages in higher-value goods in order to industrialize, develop and break free from what they viewed as global economic dependency, as contrasted with policy advice at the time to focus on comparative advantages in low-value raw commodities. Indeed, as recently acknowledged by WTO (2021), "if a country's exports are concentrated in a few products, countries are more vulnerable to a drop in demand for these products".

Importantly, the large allocations of resources and investments needed to spur such capital-intensive sectors require a central role for the State through industrial policy (Hirschman 1981, Chang 2002). The role of the State and of major investments should be underscored in the context of the transition to a green economy. The costs of investing in environmentally-friendly activities, transitioning to carbon-neutral production and adopting renewable energy have often been cited as significant impediments to switching away from fossil fuel-based production methods. Given that Africa has contributed less than 3 per cent of total Greenhouse Gas emissions, and that new industries and more energy output will be vital to the continent's transformation, policy makers have questioned the urgency and practicality of making such green investments. Yet considering that African countries already spend between 2-9 per cent of GDP to adapt to and mitigate against climate related events (ECA 2021b), expenditures that are already being made would be more efficiently spent on creating new jobs and opportunities while also helping to address climate change. Furthermore, many green economy activities provide win-wins for the environment and the economy, as noted in the examples above and their impact on growth and job creation.

One such link between green investments and industry-based development involves the use and transformation of Africa's mineral endowments, which play a key role in the global green transition. Africa holds up to one-third of the world's mineral reserves, and a significant proportion of global production of cobalt (71%), manganese (53%), platinum group metals (53%), amongst many others (Kitaw and Sloan, 2023). In mining-based economies such as the DRC, Guinea and Zambia, minerals account for over 70 per cent of exports and 20 per cent government revenues, but less than 10 per

cent of employment due to the low job-creating elasticities of the sector – a situation that arises from the extraction and export of minerals in their raw form, with limited processing or value addition. African countries adopted the Africa Mining Vision in 2009 as a blueprint for the “transparent, equitable and optimal exploitation of mineral resources to underpin broad-based sustainable growth and socio-economic development” (AU 2009).

By investing in the production and processing of minerals for the green economy, African countries can address both aspirations for industrialization and contribute to the energy transition – renewable energy generation and storage will lead to an estimated increase in demand for copper, cobalt, nickel, lithium, and other of Africa’s key ‘green minerals’ of up to 500% by 2050 (World Bank 2020). This presents a significant opportunity to harness unprecedented demand and prices for Africa’s exports and negotiate for external mining partners to transfer a greater share of value-addition in the green mineral value chain.

As these higher-value activities are promoted and new activities supported for greater export, the expansion and deepening of trade that will be part of the AfCFTA can have intervening positive and negative implications for emissions and climate change. Indeed, greater production, economic activity and shipping can increase emissions, but trade and cooperation can lead to the dissemination of more carbon-friendly technologies (WTO 2021). In addressing this, a host of partners including ECA, UNCTAD and others have underscored the importance of national strategies to ‘green’ the AfCFTA. There is an added advantage of localizing segments of global value chains and promoting regional value chains as they reduce the needed global shipping and thus emissions, while yielding new opportunities within the region.

IV. Methodology

At the nexus of these pressing issues, one oft-cited measure as a proxy for industry and transformation involves export concentration and diversification. Through examining the makeup of a country’s trade basket, and the extent to which it is comprised of either only a few goods or a wide basket of different goods, one can examine how diversified or dependent the country is on a certain number of products. As noted by Bajai et al (2022), of the many measures of export diversification and concentration, the Herfindahl-Hirschman Index (HHI), which sums the squares of the share of each sector or product in total exports, is the most robust and comprehensive of these available measures.

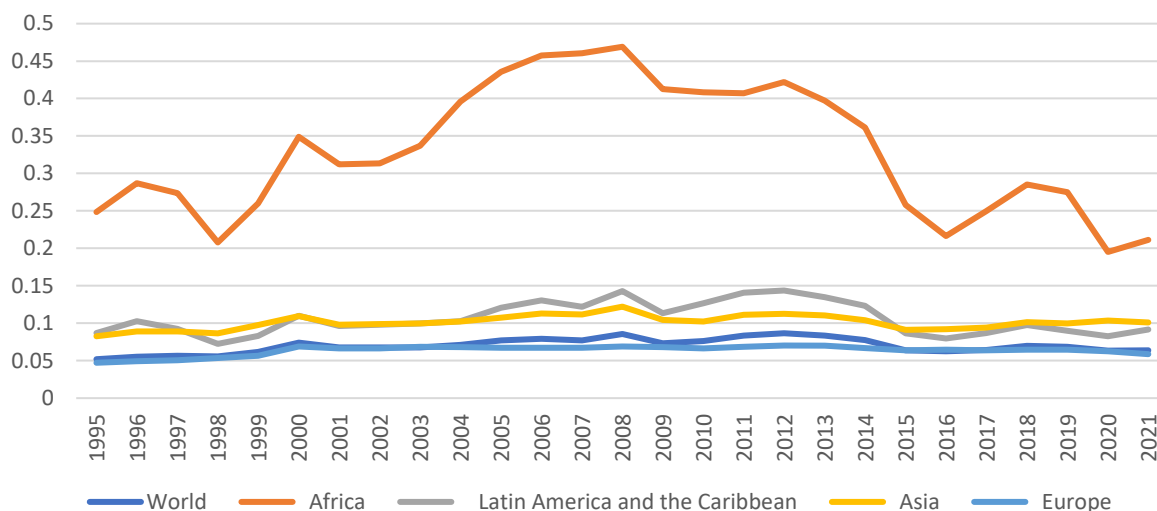
This study will make use of the HHI as presented in UNCTAD Stat data, to measure the level of export diversification globally, in Africa in general and in specific countries as well as comparative regions and countries, both before the COVID-19 pandemic and after. It will focus on export concentration, to illustrate the reliance – or lack thereof – on a small basket of goods, typified in the African context by raw commodities in the mineral, fossil fuel or agricultural sectors. This concentration is measured on a scale from 0 to 1, with 0 a completely diversified export basket and 1 a full concentration.

The study will then draw on quantitative data and qualitative observations of some specific sectors and exports in question in order to fully assess the broad HHI figures and delve into the drivers of these trends in Africa. This will allow for an analysis firstly of the trends in export diversification before the pandemic, secondly of the impact of the pandemic on this drive for diversification, and thirdly of what measures can encourage the deepening and diversification of industries in Africa that can also contribute to the global fight against climate change.

V. Analysis

A first step is to examine the broad trends in export concentration in Africa as compared with other regions – this is illustrated over the past 25 years¹ in Figure 3 below. Notable is the significantly higher level of export concentration in the region than elsewhere, which ballooned during the commodity super cycle of the early 2000s, during which the world in general saw a more muted rise in concentration as well. Africa’s concentration notably fell with the winding down of this super cycle.

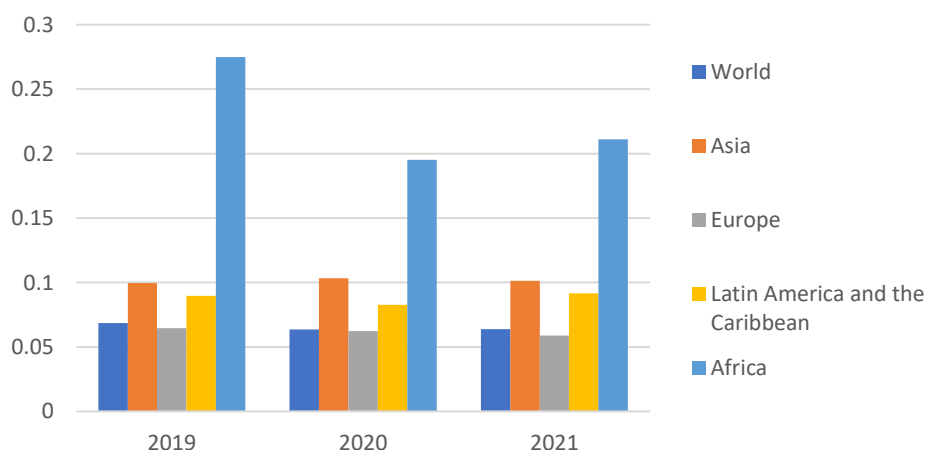
Figure 3: concentration index across regions



Source: Authors’ Calculations based on UNCTAD Stat (2023)

Another interesting trend in Figure 3 is the fall in concentration that occurred in 2020, and the slight rebound that began in 2021. Figure 4 focuses on this trend, to illustrate the magnitude of the change witnessed following the onset of COVID. Here we define a noticeable fall (or rise) by a change in the concentration index by 0.05 index points or more, to distinguish the change from other small rises and falls.

Figure 4: Concentration Index During COVID



Source: Authors’ Calculations based on UNCTAD Stat (2023)

¹ Timeframe chosen due to data availability.

Also noticeable in Figure 4 is the scale of this fall in Africa vis-à-vis other regions – a decline from an index of 0.275 to 0.195. As the Africa figure incorporates 54 member States, a focus in on the trends of each individual economy is warranted, to examine what is driving the aggregate fall in concentration. And despite the broad fall in concentration, several countries have in fact witnessed an increasing export concentration during COVID-19. Table 1 outlines those countries that witnessed a measurable rise or fall in concentration as per the 0.05 definition above.

Table 1: African countries witnessing rise or fall in export concentration during COVID

Decreasing Concentration		Increasing Concentration	
Country	Amount	Country	Amount
Cabo Verde	-0.07	Burkina Faso	+0.12
Libya	-0.11	DRC	+0.05
The Gambia	-0.08	Mali	+0.05
Sao Tome and Principe	-0.16	Niger	+0.21
Togo	-0.11	Rwanda	+0.13
		Uganda	+0.05

Source: Author's Calculations based on UNCTAD Stat (2023)

Having identified the countries with increasing or decreasing concentration, a deeper analysis of what is driving these trends will focus on the composition of these countries' specific exports that has changed from 2019 to 2020. The Observatory of Economic Complexity (OEC) provides a breakdown of a country's export and import basket, in absolute value and as a share of total exports and imports. Through this data we can examine what goods have grown or shrunk in their share of exports, to determine what trends may be influencing the changes in concentration. This will first involve an individual assessment of each country that diversified during COVID. Table 2 displays the total value of each² of these countries' top 5 exports as measured at the HS4 level, and its proportion of total exports as of 2018, and then illustrates these trends through 2020.

Table 2: Changes in export composition of main exported products, for countries that experienced an export diversification in 2020				
	<u>2018</u>	<u>2019</u>	<u>2020</u>	
	Product as % of Exports			
Libya	crude oil	83.3	80	64.5
	petroleum gas	8.68	11.8	9.73
	refined petroleum	3.56	3.23	1.15
	gold	2.57	3.66	19.1
	scrap copper	0.31	0.19	1.13
	Export concentration	0.856644	0.823448	0.71385
	Value of all exports (bn)			
	31.3	32.6	8.66	
	Product as % of Exports			
The Gambia	coconuts, brazil nuts, cashews	30.9	13.1	7.97
	rough wood	11.2	18.9	2.01
	non-fillet frozen fish	8.22	2.45	6.01
	refined petroleum	5.85	4.23	0.04
	gold	0.35	27.8	59.8

² Cabo Verde and Sao Tome omitted due to small relative trade flows and other sectoral compositions as compared with other countries

	Export concentration	0.285381	0.307568	0.227792
	Value of all exports (bn)	0.119	0.246	0.359
	Product as % of Exports			
Togo	refined petroleum	43	32.8	23.1
	gold	11.4	2	2.83
	calcium phosphates	4.49	4.85	6.93
	crude petroleum	4	7.99	1.62
	cement	3.44	3.68	5.68
	Export concentration	0.359188	0.30172	0.192646
	Value of all exports (bn)	3.26	2.34	1.84

Source: OEC 2022, UNCTAD Stat 2022

A major fall in the main export of all of these countries is notable – crude oil, crude petroleum, nuts, cocoa beans and refined petroleum. These top exported products had been driving the concentration of each export basket, with their fall vis-à-vis other products influencing a perceived increase in diversification. The literature above notes the importance of diversification for structural transformation, but the diversification here would reflect not the industrialization of the economy as the instrument, but rather the vulnerability the countries had to raw and primary exports, and the visible impact of the collapse in trade of these goods due to COVID19. This is particularly notable for Libya, a significant driver of these findings, where from 2019-2020 crude oil exports fell from 1.1 million to 350,000 barrels per day, with its share of total exports also falling from 80 per cent to 65 per cent (EIA 2022; OEC 2022).

If this is the case, a next question is why other countries with similar pre-COVID dependence on a small basket of raw material exports did not witness a similar perceived diversification due to the collapse of these products. For comparison, we bring in Algeria, Angola and Nigeria, who are commodity-dependent but experienced no measurable diversification, in Table 3. Interestingly, Angola and Nigeria were able to continue the export of crude petroleum in roughly the same proportion of total exports in 2020. As with the ‘diversified’ countries above, total exports witnessed a significant drop in general; however, the other goods in these three countries’ export baskets remain relatively constant. If all major exports maintain their share in total exports, then the level of concentration will remain the same.

		2018	2019	2020
	Product as % of Exports			
Algeria	crude petroleum	39.6	40	40.4
	petroleum gas	36.2	34	31.2
	refined petroleum	18.2	18.8	17.9
	nitrogenous fertilizers	2.13	2.34	4.02
	ammonia	1.19	0.97	1.02
	Export concentration	0.483077	0.469802	0.443313
	Value of all exports (bn)	38.4	33.2	20.1
	Product as % of Exports			
Angola	crude petroleum	82.8	83.8	79.6
	diamonds	5.92	7.71	10.4
	petroleum gas	4.72	4.75	6.05
	refined petroleum	1.15	1.28	1.47

	passenger and cargo ships	1.12	0.37	0.042
	Export concentration	0.862249	0.894797	0.873198
	Value of all exports (bn)	44.8	37.2	23.8
	Product as % of Exports			
	crude petroleum	74.3	71.9	71
	petroleum gas	13.5	12.2	13.7
Nigeria	tug boats	1.9	0	0.08
	refined petroleum	1.39	0.79	1.42
	gold	0.95	0.54	0.51
	Export concentration	0.786345	0.785834	0.741563
	Value of all exports (bn)	63.1	64	43.1

Source: OEC 2022, UNCTAD Stat 2022

The findings for these comparison countries then warrant an examination of the other exported products of the diversified countries, to see what other items might have grown as a proportion of exports during COVID to drive this diversification. A second notable trend becomes clear: the dramatic rise in gold's role amongst exported products – rising from accounting for less than 5 per cent of total exports in Libya and The Gambia, to roughly 20 and 60, respectively³. Thus a simultaneous collapse in trade for most goods, coupled with the boom in one product (gold), to drive a perceived diversification.

The role of gold in influencing export data is even more apparent in countries which experienced an export concentration during COVID, illustrated in Table 4. Gold was already the largest export of Burkina Faso, Mali, Niger, Rwanda and Uganda before its price rose and COVID impacted the trade of other goods, leading to an extreme role of gold in exports by 2020. When discussing gold producers in Africa, a notably absent country in this analysis is South Africa, where stringent lockdowns lead to a fall in production, from \$17 billion in gold exports in 2019 to \$13.1 billion in 2020, despite the gold price rise (OEC 2022). Further absent is Ghana, for which OEC lacks this product-level data.

		2018	2019	2020
	Product as % of Exports			
	gold	75.7	77.5	87.8
	raw cotton	5.7	6.53	3.31
Burkina Faso	coconuts, brazil nuts, and cashews	3.83	1.9	1.17
	zinc ore	3.46	2.9	2.44
	other oily seeds	3.36	2.7	1.78
	Export concentration	0.692138	0.716986	0.833298
	Value of all exports (bn)	5.67	6.09	8.26
	Product as % of Exports			
	refined copper	46.2	63.1	57.7
DRC	cobalt	19	12.1	12.7
	cobalt oxides and hydroxides	11.8	7.77	15.6
	copper ore	7.23	3.61	1.31
	cobalt ore	3.11	1.15	0.66

³ The proportion fell for Togo.

	Export concentration	0.46861	0.524578	0.574018
	Value of all exports (bn)	18.1	16.1	18.9
	Product as % of Exports			
Mali	Gold	75.2	78.8	93.6
	Prepared Cotton	10.3	7.27	0
	Bovine	2.81	2.59	0
	Raw cotton	2.01	1.67	0.91
	Export concentration	0.717362	0.788438	0.842352
	Value of all exports (bn)	4.58	5.8	5.02
	Product as % of Exports			
Niger	gold	18.4	31.7	67.3
	palm oil	16.2	3.83	0.58
	refined petroleum	14.4	15.1	7.9
	rice	13.3	0.34	0
	other oily seeds	9.39	14.9	8.53
	uranium and thorium ore	1.13	15.7	2.93
	Export concentration	0.299917	0.346236	0.554112
	Value of all exports (bn)	1.66	1.44	2.63
	Product as % of Exports			
Rwanda	gold	43.9	36.1	47.2
	nobium, tantalum, vanadium and zirconium ore	8.13	5.05	3.64
	tin ores	5.28	5.45	2.96
	coffee	5.03	6.35	5.41
	tea	4.59	5.4	6.18
	Export concentration	0.415368	0.434071	0.566876
	Value of all exports (bn)	1.62	1.32	1.37
	Product as % of Exports			
Uganda	gold	38.6	41.5	59
	coffee	11.5	11	9.13
	dried legumes	2.43	0.94	0.63
	fish fillets	2.42	2.37	1.12
	corn	2.25	1.26	0.88
	Export concentration	0.27029	0.376602	0.42662
	Value of all exports (bn)	4.26	4.11	5.88

Source: OEC 2022, UNCTAD Stat 2022

VI. Gold as a cash cow but with limited contribution to sustainable development

Gold has had this marked intervening impact on export baskets due to its market price rise in recent years, from an annual average of \$1,269 per troy ounce in 2018 to \$1,393 in 2019 and \$1,770 in 2020, peaking at \$1,902 on 24 July 2020 (World Bank 2022; Koh and Baffes 2020). This was driven by demand for 'safe-haven' assets during crises and uncertainty (Koh and Baffes 2020), with gold viewed as insulated from uncertainty, inflation and exogenous shocks (Denham 2020).

Upon closer inspection, the major COVID-related change in export concentration – whether an increase or decrease – has been significantly influenced by two global phenomena: the collapse of oil

and the rise of gold. These major forces alter the traditional interpretation of a decrease in export concentration as a positive development that bodes well for higher value-added activities associated with industry, services, and overall structural transformation. On the contrary, they reflect the impacts of crises on countries that rely heavily on a narrow selection of raw commodities.

The gold sector itself suffers from the typical limited linkages with the broader economy and low employment elasticities that often plague the mineral and extractives sectors in general. Gold continues to occupy a major share of economic activity in its main producers in Africa, but with diminishing returns on more developmental indicators. For example, while mining – with gold the primary contributor – accounts for nearly 50% of Ghana’s exports, this share falls to 22% for government revenue, 6.8% of GDP, and only 2% of formal employment (AMDC 2018). Thus growing export activity holds less potential for transformative job creation than other higher-value-added activities.

A closer examination of the role of gold for some of these case studies reveals some unique findings regarding processing and export trends. Some countries such as The Gambia, Rwanda and Uganda are not typically considered amongst the continent’s leading gold producers. However, in the case of Uganda, it is home to East Africa’s major gold refinery, African Gold Refinery (AGR) Limited, which processes gold from across Eastern Africa. By contrast, Ghana has only recently planned to commission its first gold refinery, as a joint venture between the Government and an Indian private-sector partner, which was set to commence operations in August 2022 (African Mining Market 2022). When examining The Gambia’s gold exports, it is revealed that Uganda is by far the largest export destination. Many of these trends in fact reflect the re-exportation of gold, some of which has been documented as imports but a substantial proportion of which is also likely supplied through off-the-books and illegally smuggled imports, namely from DRC (Neiman, 2021). It has been well documented that extractive sectors are the leading contributors to Illicit Financial Flows from Africa, estimated at over \$80bn annually, and these kinds of smuggling chains deprive States of needed resources to invest in sustainable development and economic transformation (AMDC 2017b). Indeed, gold in general is particularly vulnerable to smuggling and the involvement of illicit parties in its mining and export. AGR has subsequently been sanctioned internationally and taxed nationally due to its alleged role in these activities.

Beyond this aspect of illegality, the role of an economy as a re-exporter of goods further undermines its vision for a sustained expansion in new activities that create jobs and link with the broader economy. Here the growing export figures reflect more an accounting phenomenon than an economic or industrial activity. Moreover, the job elasticities are as limited as the mining activity itself – AGR publishes that it employs only 85 Ugandan staff, in contrast with its commanding role in regional gold trade and processing (AGR 2017). More broadly, gold traditionally presented fewer downstream processing and value-addition opportunities for African countries to capture locally. Unlike other minerals, processed gold fits into three general categories – jewellery, gold bars as a store of value, and small gold inputs to electronic and other devices. If value-addition to gold is to be the driver of a wider-reaching industrialization and transformation, it would need to also harness upstream and sidestream linkages to other activities, given these limited downstream opportunities. However, new opportunities for the use of gold as an input to technologies for the global green energy transition are emerging, and in this sense the region’s gold sector can serve as an input to regional green mineral value chains, to be detailed shortly.

A further and crucial point is that the gold mining activities incentivized by higher global prices can be destructive to the local environments of the mining communities themselves, and contribute to global emissions. While national energy grids in many countries are increasingly based on renewable and

green sources, mining is often off-grid and many times reliant on generator power. In many contexts in Africa, diesel trucks are used to transport minerals to ports, with more efficient rail opportunities remaining limited. Amoako et al (2018) found that electricity and fuel use in transport accounted for 92.5 per cent of emissions in large-scale gold mining in Ghana, and that emissions reduction targets in major mining countries such as Australia have been ineffective, with mining emissions rising 22 per cent since 2005. Expanded mining activities would therefore need to harness green methods, such as the focus on water efficiency of Chile, and growing the renewable energy base for mining regions.

Furthermore, gold mining, like other mineral activities, is characterized by a high proportion of Artisanal and Small-Scall Mining (ASM), with up to 20 per cent of global gold supplied by ASM, and a conservative estimate of over 10 million people involved in ASM in Africa (IGF 2016; AMDC 2017a). Informal ASM miners are more prone to use mercury, which helps to identify gold deposits, but which is extremely damaging to the ground and water where it is used. Mercury is also extremely hazardous for the miners themselves, over half of whom in ASM are women, leading to impacts such as irreversible brain damage (IGF 2016).

These trade trends, and the incentives in certain sectors they represent, will have significant implications for the world's sustainable development outlook. All seventeen Sustainable Development Goals (SDGs) are impacted by mining, with SDGs 3, 5, 6, 7, 8, 9, 10, 12, 13, 14 and 15 particularly and directly impacted by the effects of mining discussed here. There is a similar implication of mining for the goals of Agenda 2063, including the recently-completed first ten-year implementation plan, including goals 1, 3, 4, 6, 7 and 17. Countries pledged to keep global temperature rises to a maximum of 2 per cent higher than pre-industrialization – and ideally only 1.5 per cent higher – in signing the 2015 Paris Convention. Meanwhile, mining is directly responsible for 4-7 per cent of greenhouse gas emissions and growing, with increasing mining brought on by rising prices in the case of gold, or growing demand in the case of minerals for the green transition (Delevingne et al 2020). These authors further note that emissions-reducing targets set by mining companies are far below those needed to reach the Paris Agreement goals.

The major lessons here are that despite the major driving force of gold behind many macroeconomic figures, including the perceived diversification (or concentration) of Africa's export figures, it represents neither the job- and income-generating high value activity envisioned to drive transformation, nor a climate- and ecosystems-friendly activity in line with the regional and global commitments to sustainable development. However, the factors of production of extractive sectors in general and gold mining in particular hold immense potential if applied or directed towards new and growing activities in green mining and production for the green transition, including linkages with other transformative activities.

VII. How infrastructure for gold can be re-applied to other transformative resource activities

The literature on industrialization and economic transformation introduced earlier, from Prebisch to Hirschman to Chang, concludes that shifting away from dependence on lower-value primary commodities requires concerted efforts to build new competitive advantages, rather than relying on existing comparative advantages which may lock them in at lower rungs of economic participation and development. The significantly changing export concentration and diversification dynamics following the shock of COVID have put a spotlight on the commodity dependence examples of this paper, namely gold but also fossil fuels. These sectors do, however, hold the potential to be harnessed as catalysts for other activities, with the critical mass of infrastructure and investment surrounding

existing extractive activities able to fuel a higher-income, more inclusive and greener economy. Such a path will require a host of interventions, guided by an organized framework involving the State, private sector, citizens and all stakeholders.

a. Diversification based on assets and competitive advantages

It is possible to build higher-value and transformative industries based on primary resources, and many examples for this exist in the African context. ECA (2013) examined a host of opportunities in commodity-based development and building linkages across activities, summarized in Table 5 below. This utilised surveys of businesses involved in each value chain, to identify the main barriers to value-addition and the most critically needed interventions. Skills, capabilities and quality of domestic suppliers is consistently raised as a key issue across sectors, mandating a comprehensive and implementable system of support and programmes for local entrepreneurs and SMEs. In an example on gold mining in Ghana in particular, there is much existing local potential in skills and existing firms. Regarding upstream suppliers, local sourcing for the three largest foreign gold mining firms stood at 67-79% of total spending in 2011, relying on over 1,000 local supply firms. As with the general findings, quality, innovation and trust are the three most important criteria for gold mining actors in choosing suppliers, and are the main issues holding back greater procurement from local firms. Meanwhile, infrastructure is the greatest hindrance to downstream linkages in refining and processing. The situation in ECA (2013) is comparable to the market trends today, as the analysis was undertaken at a time of rising gold prices due to both the commodity super cycle and continuing uncertainty following the global financial crisis and taper tantrum, leading to demand for safe assets and stores of value.

Table 5: Opportunities for linkages and value-addition in Africa, by commodity

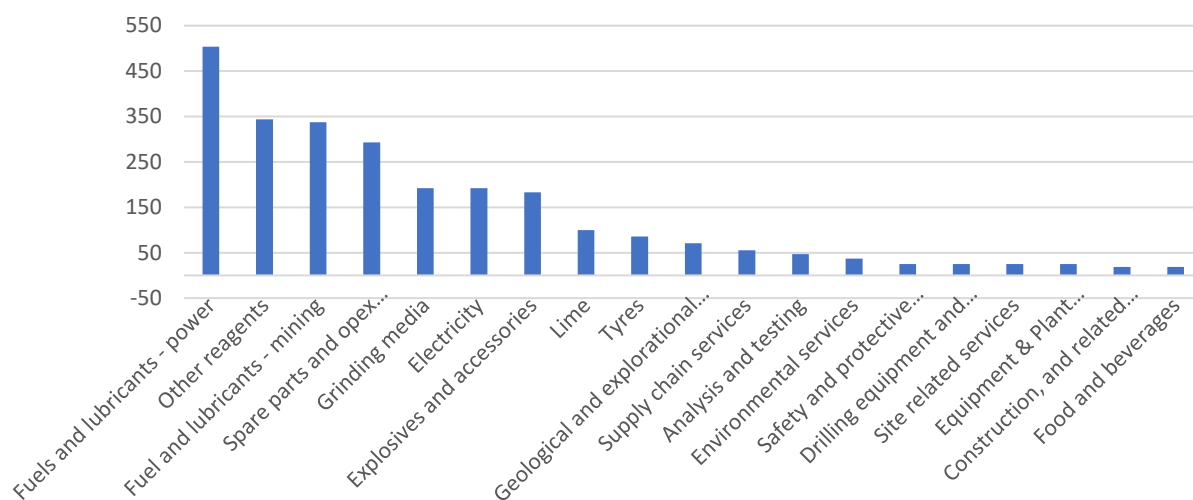
<u>Commodity</u>	<u>Downstream linkages</u>	<u>Upstream linkages</u>
Agriculture – cocoa, coffee, tea, agro-products		
Industrial commodities – cotton, textiles and clothing, leather, oil, copper, gold and mining supplies	Semi-processing, processing, marketing	Supply products for farmers, miners and factories

Source: ECA 2013

A deeper assessment by AMDC (2018) looked at the linkage opportunities from gold in Ghana and sub-regionally through value and supply chains across West Africa. The study undertook a market assessment of manufactured mining inputs that have the potential to be produced locally, service the regional market, and which can also serve other sectors beyond mining. The findings reveal 19 products, the local production and procurement of which would generate a cumulative \$2.66 billion based on demand across four West African countries⁴, as detailed in Figure 5.

⁴ Burkina Faso, Cote d’Ivoire, Ghana, Mali.

Figure 5: total procurement across four West African countries of focus, by product (in US\$, millions)



Source: AMDC 2018

There are clear examples of how the growing role of the gold industry could be used to spur true industrialization and diversification. A main intervention to facilitate this, as noted in the studies consulted, is through engaging with and supporting local firms. Regarding local firms' skills and capacity development, AMDC (2018) recommends a suppliers development programme to oversee this. WTO (2021) recognizes that diversifying is costly for individual firms – finding new suppliers, reaching new economies of scale and so forth require significant investment – and thus collective action and guidance from the State is crucial. It notes that clear, transparent and predictable business regulations and policies can incentivize investments in new and diversified activities.

Such aims will get a boost from the implementation of the AfCFTA. The upstream gold inputs identified here harness procurement across four countries due to the relatively limited size of each individual market, and the AfCFTA is envisioned to reduce official and unofficial barriers to doing business across borders, building on the integration witnessed through Africa's Regional Economic Communities. Regional arrangements that boost local firms are at the centre of the AfCFTA's role for industrialization.

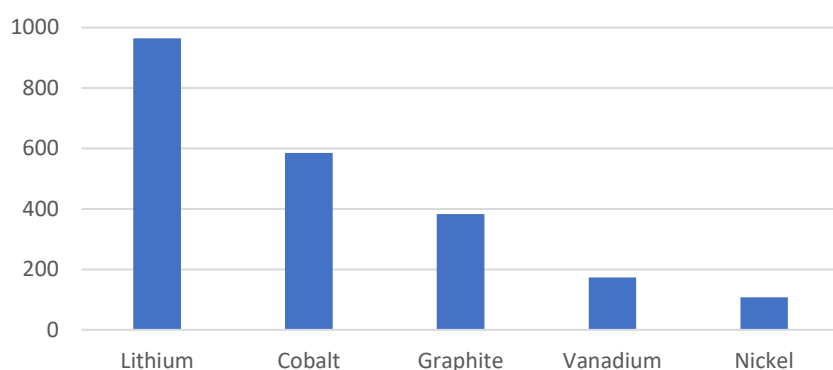
But importantly, the local mining firms and suppliers surveyed by ECA (2013), and those with potential to provide the products listed in AMDC (2018), are not necessarily locally owned firms, but rather firms located in the region, regardless of ownership structure. This speaks to a major issue with Local Content Policies in the sector. Local Content is an important tool to encourage greater procurement and employment locally by firms in the mining sector. Such policies are crucial to ensure that lucrative extractive activities provide commensurate local employment and procurement. Yet in practice many such policies may serve as box-checking exercises, allowing for local sourcing of low-value products but import of high-value inputs, with ownership and high-level business and engineering posts held by foreign interests. IGF (2018) outlines key ways to make sure local content policies work for mining communities, including ensuring the policies match national development objectives, are based on realistic assessments of the potential for local industry, and understand and define their aims in local procurement, direct employment, and linkages with other sectors. Such a local content system must

be underpinned by strong monitoring, review and enforcement. These tools will help ensure that gold and other mining activities contribute to real linkages and economic diversification.

b. The green minerals boom

Further opportunities to link this growing gold sector with broader economic activities are presented by the ongoing global green minerals boom. As countries transition to renewable sources of energy and transportation facilitated by electric vehicles, these shifts will require new materials for turbines, solar panels and other devices, and extensive energy storage capacity facilitated by batteries that rely heavily on a specific set of minerals. An immense increase in production would be needed to meet growing demand, illustrated in Figure 6. While African countries expand mining and export, they are also in a unique position to mandate for more local value addition and linkages from these activities. This increased bargaining position will emerge for a number of reasons. As Africa accounts for an immense global share of some minerals, such as over 70 per cent of cobalt and over 60 per cent of manganese, it has the market power to mandate expanded local procurement and partnerships from multinational firms. African countries are also emerging as new and alternative partners as the global community aims to diversify supply chains and reduce geopolitical risk of concentration of production.

Figure 6: per cent increase in mineral production needed for the green transition



Source: Kitaw and Sloan, 2023

In taking advantage of this bargaining power, countries can pursue new and more equitable joint ventures with global leaders in services and manufacturing, to ensure greater skills and technology transfer, and the setting up of production centre in the country. Linking with the discussion on diversification based on existing endowments, countries can also position their traditional mining assets to plug into the green transition. The technology, capital, energy and other inputs needed to operate gold operations such as AGR can be put to good use serving the minerals needed for the green economy, becoming a regional processing centre servicing inputs to Lithium Ion Batteries (LIBs) and Electric Vehicles. Initiatives such as the joint push to manufacture LIBs in DRC and Zambia enjoy significant political will and movement thus far, aiming to capitalize on the green minerals boom and the extensive assets possessed within the region. Currently, ECA, Afreximbank and other key partners are supporting the development of a regional battery mineral supply chain, centering on DRC and Zambia but with linkages to expand throughout the region. Initial steps including a communal centre of excellence for battery technologies, and cross-border battery mineral special economic zone, will help this boom translate to greater local value-addition and job creation.

c. Greening current and future activities

Another important step is to make sure that this current and planned mining – for gold, green minerals and other products – in fact be made greener and more environmentally friendly.

Delevingne et al (2020) note that mines can decarbonize through greater efficiency, electrification, and harnessing renewable energy. Carbon-capture, on-site recycling and other initiatives present win-wins for mining and the environment. While they can often be capital-intensive activities, they can reduce long-run costs by eliminating waste and linking with State utility grids. Such projects can also form part of national and regional plans to combat climate change. New climate financing mechanisms – such as green and blue bonds, climate-for-debt swaps, and the Liquidity and Sustainability Facility (LSF) – present sources of funding for green initiatives. A focus on green mining and manufacturing can also draw more investment and interest in the region, as BloombergNEF (2021) notes that building a cathode precursor facility in DRC is greener and lower in cost than in China, Poland or the USA.

Platforms and frameworks also exist to address the community-level environmental degradation and human rights issues stemming from mining. In ASM, proactive engagement with miners to extend the benefits afforded to formal firms and miners is an important first step. Full implementation of the Minamata Convention on Mercury is necessary to begin addressing many of these environmental and health impacts of mining.

The region's move to more value-added activities along mineral-based value chains, and diversification into other manufacturing activities, can also be 'greened'. ECA (2016) notes four entry points that can induce a greener industrialization: changing price incentives, regulating environmental standards, greening public infrastructure, and carbon decoupling. An alternative path based on these interventions would also lead to higher GDP per capita, exports, lower poverty and other improved outcomes as compared with a business-as-usual scenario. Numerous positive cases of greening production processes exist, ranging from firm-level examples such as Leather Industries of Uganda pursuing a comprehensive resource-efficient and clean production approach, to collective cases such as Ethiopia's Hawassa Eco-Industrial Park, and national energy initiatives including biofuel in Malawi, solar in Morocco and geothermal in Kenya.

VIII. Conclusion

This paper has sought to examine trends in commodity-dependence in African economies, using the impacts of the COVID19 pandemic on export concentration, to reveal specific drivers of this commodity dependence and the implications they have for the continent's agenda for sustainable development and transformation. Initial findings on export concentration from 2018-20 give the initial impression that the region and many countries in particular were able to reduce dependence on a few key commodities for the export basket, from an index of 0.285 to 0.195. Yet the intervening causes of this, namely the collapse in global markets for fossil fuels concurrent with spiking gold prices, have further underscored the outsized role of commodities for Africa's economies.

The paper therefore highlights gold and the broader commodity drivers of export concentration changes during COVID19, and draws on studies and examples of green growth and industrialization, to contribute to the literature on policy actions that can directly address these issues. Commodities present a plethora of opportunities for value addition – from downstream beneficiation, to upstream value-added inputs to mining, to sidestream linkages with other sectors. Examples of these opportunities in the gold sector in particular take on renewed significance amidst the ongoing green transition, where capacity to extract, add value to and export all minerals – and 'green' minerals in particular – is a central topic in the global sustainable development agenda. Here, a clear potential exists to link the extractive sector with other green economy activities, both through products for the

green transition and through greening production processes. Africa has a renewed opportunity to harness its minerals as a tool for greater and more inclusive development, driven by the centrality of the region to the green transition and using these resources as a key bargaining tool to capture greater value-added and job-creating activities on the continent. Overall, many opportunities can be seized upon to incentivize local production, bring in foreign investors and partners in a more constructive role, and lay the groundwork for a more diversified and green growth model in Africa.

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