Gold, Economic Transformation and Regional Integration in Africa

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Abstract

The paper considers the role of Africa's regional economic communities (RECs) in increasing the returns to African countries from gold mining and advancing the economic transformation agenda of the numerous gold provinces on the continent. Several options are considered for the use of gold and gold mining to increase economic returns from the sector. Beneficiation, i.e. the transformation of gold into gold jewellery, while potentially the most beneficial in terms of possible employment creation is the least commercially propitious. The strengthening of fiscal linkages is vital given the incidence of gold smuggling and allegations of gold theft as well as the prevalence of illicit financial flows. The third option is to attempt to develop backward linkages through the development of mining feedstocks. The potential economic benefits of backward linkages are estimated in the mining sector. This option of development runs into the problem of economic polarisation where mining feedstock would almost certainly be produced in a small number of countries, most notably South Africa. A regional architecture is suggested that would create a 'mining feedstock community' similar to Europe's coal and steel community with appropriate mechanisms for counteracting the effects of trade and economic polarisation. In both the case of fiscal and backward linkages the role of the African RECs are central. However, the proposal faces considerable political hurdles.

Keywords: Gold, Mining, and Regional Economic Communities.

A. Introduction

The purpose of this paper is to examine the options for the development of new growth sectors in Africa using one of the continent's most important and expanding exports - gold. There exist several options for the management of the resource. At a political as opposed to an economic level the one most commonly argued use is that gold should be processed into jewellery. The world's biggest producers of jewellery are India and China. And for the former, there are almost no mineral resources. The most important and tangible driving force for African countries in terms of gold beneficiation is the 4.3 million Indian citizens employed in the production of jewellery (which includes gold, diamonds and other metals and gems)[2]. In many cases, these Indian producers are making use of gems and precious metals coming from African countries as the country has few operating mines producing these commodities.

The paper begins with a consideration of the increasing importance of gold mining and exports to African countries. It considers three separate approaches to making use of the gold resources for economic transformation. The first is the political aspiration of African leaders to make use of gold for the manufacture of gold jewellery, i.e. beneficiation. This objective is very much at the heart of political and aspirational documents of African leaders such as the African Mining Vision [3] as well as regional industrial policies[4]. The second part of the paper considers the appropriate role of regional bodies in assisting African countries deal with what appears to be the increasing incidence of gold theft and smuggling, illicit financial flows and other forms of trade malpractice that occur both in large-scale

mining (LSM) and amongst small-scale and artisanal gold miners (ASGM). The third part of the paper looks at the type of trade and economic arrangements that are necessary to assure that African countries benefit from backward linkages to the gold mining sector which are amongst the commercially more propitious options for gold producing countries. However, to overcome the issue of inherent geographic and economic disparities between African countries and the resulting economic polarisation that is likely to occur with any attempt to develop backward linkages a regional approach is suggested that recognises the constraints to a transformational approach to the minerals sector.

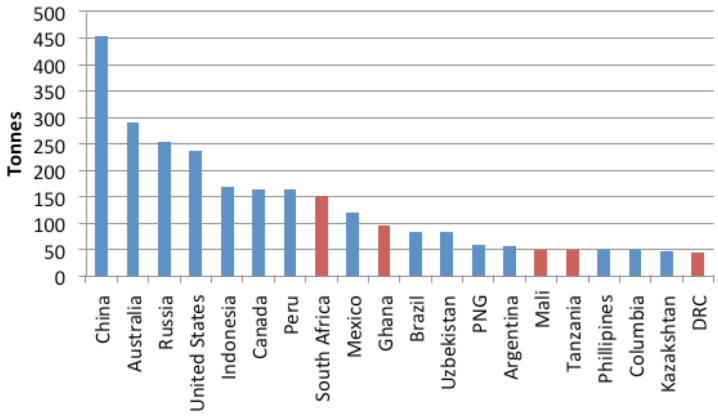
Coupled with a large number of mines becoming marginal, and with the prevalence of economies of scale[5], African countries have sought to create employment by trying to lever their gold resources in such a way as to attain greater value addition through beneficiation[6]. By beneficiation, it is meant the creation of forward linkages though some countries have sought to develop backward linkages which will also be analysed later in the study.

B. Gold in the African Context

In 1968 South Africa produced some 77% of what was the non-communist world's supply of gold. It is estimated that some 40% of the world's total gold supply came from the mines of the Witwatersrand[7]. Regarding employment, it peaked in 1988 in South Africa at 480,000[8] but had fallen to 120,000 in 2016. Extrapolating from the South African employment figures gold mining in Africa would employ approximately 470,000 workers in the African large-scale gold mining sector. Employment in the ASGM was considerably more significant than that of the LSM sector though no reliable employment estimate for the sector in Africa is available. The value of this production for exports can only be estimated given that gold trade statistics are notoriously inaccurate. The value of African production was an estimated US$23.6 billion in 2016[9]. Thus, based on these price calculations, gold production constitutes some 7.3% of total African exports for 2016.

Currently, half the gold mines in the Witwatersrand are considered to be marginal[10] as many are operating at depths of some 3,000 metres. South Africa has declined from producing 77% of world supply to slightly over 5% in 2016 but remains the single largest producer in Africa accounting for 22% of total African mined production in 2016. Despite this decline in the importance of South Africa, Africa as a whole has become an increasingly important supplier of gold with African countries being amongst five of the top twenty producers.

Figure 1: Top 20 Mined Gold Producers (2016)
Source: GFMS Thompson Reuters



Source: GFMS Thompson Reuters

Gold is produced and exported in significant quantities by some 19 African countries out of 54 members of the African Union. According to the World Bank database, there are 102 producing gold mines in Africa. There are 82 mines in the advanced stage of planning which brings the total countries from the database that are both producing and are in the advanced stage to 28. This number does not include gold coming from artisanal and small-scale gold mines (ASGM) which frequently creates far more employment than hard rock mines but is produced in small volumes.

The importance of African gold producers is depicted in Figures 2 (a) and (b) below. As can be seen even with the decline in South African production there has been a significant increase in total African gold production over the last decade. This has been the direct result of the decreased perceived risk of mining exploration and development in what were

Figure 2 A

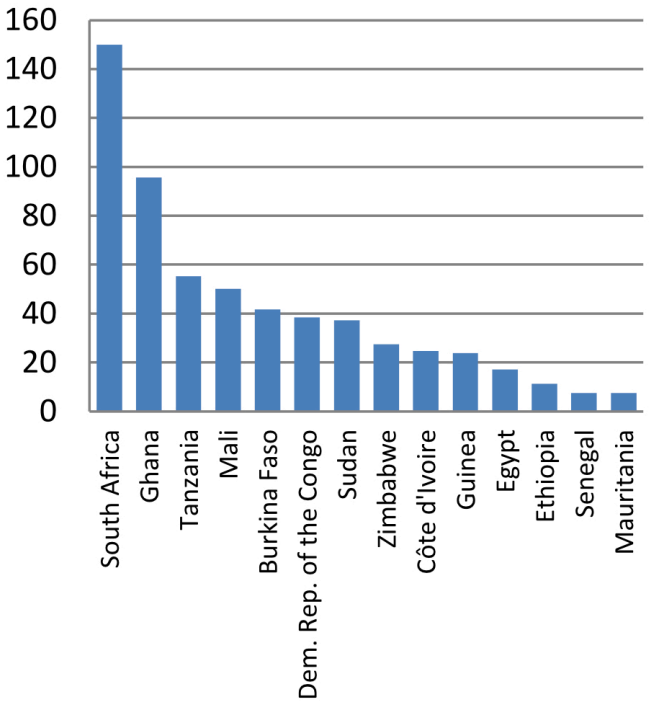
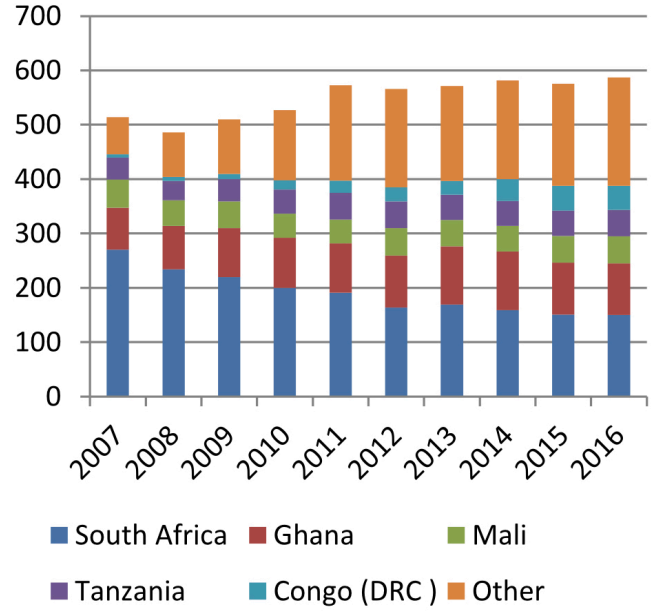


Figure 2 B



otherwise undeveloped jurisdictions, many of which had experienced relative to that which existed in the 1990's during the periods of intense armed conflict in the 1980's and 1990's high conflict in Africa.

While African gold production has been rising over the last decade and coming from an ever increasing number of countries which have traditionally not been gold mining provinces e.g. Egypt the number of refineries has not significantly changed and the only refinery that is accredited to produce 'Good Delivery' gold bars is the Rand Refinery in Germiston South Africa[11]. There are at least seven other refineries in Africa[12], outside of South Africa, but none are accredited to the London Bullion Metal Association (LBMA) and hence cannot produce bars that can be traded in the loco-London market OTC which accounts for 70% of world trade. There was one other refinery, Fidelity Printers in Zimbabwe[13] which had LBMA accreditation and fell below the minimum level of production for LBMA accreditation of 10 tonnes per annum during the 2008/9 crisis and lost its accreditation leaving the Rand Refinery as a monopoly on the African continent. However, given the global nature of refining and the relatively high cost of transportation of doré along with very large excess capacity amongst LBMA accredited refineries this monopoly may be of limited commercial value. Many of the small refineries that are dotted around the continent derive their supplies from the ASGM sector and would find it very challenging to be able to control their value chains and identify their suppliers.

C. Forward Linkages- Gold Beneficiation and Jewellery Manufacturing

Three potential uses of gold stand as possible areas of downstream beneficiation. Historically and still to this day the most important is jewellery production. Of the 4,511 tonnes of gold produced by primary refineries and secondary recyclers, some 1,891 tonnes was used for manufacturing jewellery which historically is the oldest and most significant manufactured use of gold. A further 354 tonnes was used in various manufacturing activities such as electronics, dental use and ornamental uses. In all of these manufactured uses, gold has become less significant with manufacturers seeking cheaper alternatives where they can. Even the traditional use of gold to weave wedding gowns has succumbed to the new price peak for gold established in the wake of the 2012 boom and have begun using gold of lower caratage for weaving into dresses. The production of jewellery remaining the only area with potential to create both employment and forward linkages.

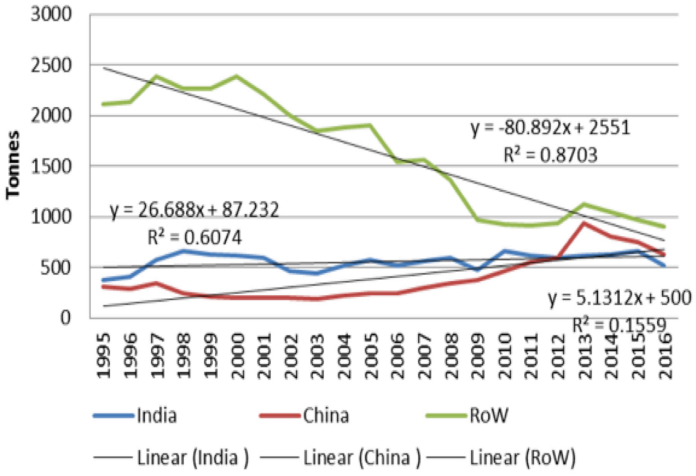
Political leaders commonly argue that having an endowment of mineral resources in a country should provide a source of commercial advantage for those wishing to add value to their unprocessed minerals. The empirical evidence does not necessarily support this argument, and many African countries have struggled to transform the presence of minerals into a commercial advantage further down the value chain. The case of South Africa, which in the 1960's produced, in any year, over 70% of the world's gold and a similar percentage of diamonds until the 1970's while remaining the world's dominant producer of platinum (68% of world production in 2015) stands as an essential counter-example as it never developed a very significant gold jewellery fabrication capacity despite concerted attempts to do so in both the pre and post-apartheid era. This industry, at least as it pertains to the local market is now in rapid decline to the point where some 80-90% of jewellery sales in South Africa are currently imported[14]. In South Africa, the use of gold in the manufacturing of jewellery stood at 2.5 tonnes in 2016, down from 7 tonnes in 2007[15]. Due to trade preference arrangements in the USA such as AGOA jewellery exports have expanded while production for the local market has declined.

Many countries in Africa have gems and jewels and in many cases a long history of gold jewellery production dating back to the pre-colonial era and therefore it is seen at a political level as a logical reason for attempting to develop a local jewellery manufacturing sector. However, this indigenous capacity to make and refine gold only exists in small pockets. The bulk jewellery sector in Africa for Africans is made up of production of products, not made from gold but are referred to as costume jewellery and these are imported mainly from China. There exists a small local and tourist market for gold as well as one in the African diaspora.

Production of gold jewellery in such volumes that would absorb significant numbers of unemployed African workers would require incentives to induce Green-fields investors to consider an African country as a location for such an investment. Any state must review the following facts (and constraints) considering the development of such forward linkages:

- Declining Global gold jewellery demand.. This decline in gold use and demand exists at a global level despite rising consumption in India and China, the world's two largest producers and consumers of gold jewellery. The decline in demand stemming from a change in taste amongst a new generation of so-called 'Millennials' who have less interest in gold jewellery given the widening range of luxury commodities available to them.

Figure 3: India, China and RoW Gold Jewellery Consumption (tonnes per annum 1995-2016)



Source: World Gold Council https://www.gold.org/research/gold-demand-trends/gold-demand-trends-full-year-2016/jewellery and author's calculation

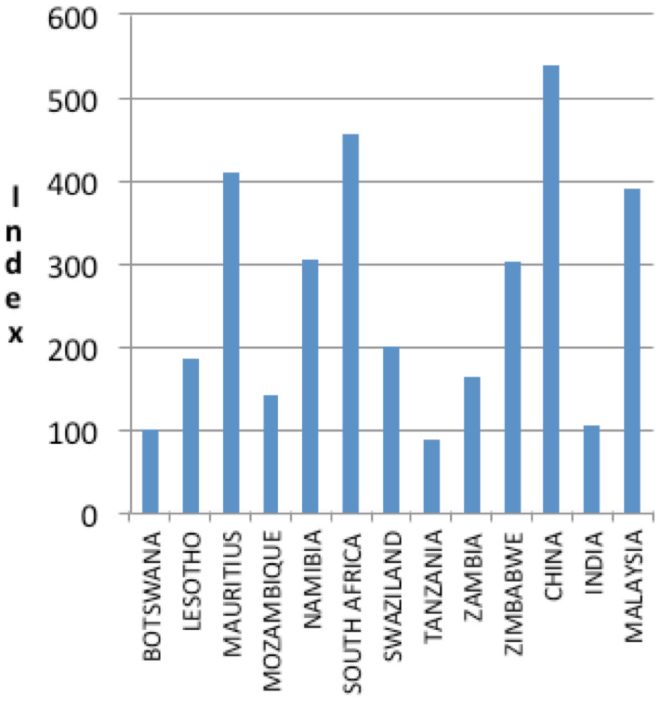
- The commercial reality of competition. India and China are both biggest markets for gold jewellery but at the same time the biggest and the world's most competitive exporters of gold jewellery. The advantage of commercial, physical and cultural proximity of Indian and Chinese gold jewellery producers to their local consumers should not be seen as minor by those contemplating entry. Furthermore, both India and China have Export Processing Zones (EPZs) which offer the usual range of tax concessions and duty and VAT free trading that are found in many countries for the production and export of Jewellery.

- Cost of unskilled, skilled and professional labour. In comparison to India and China, the

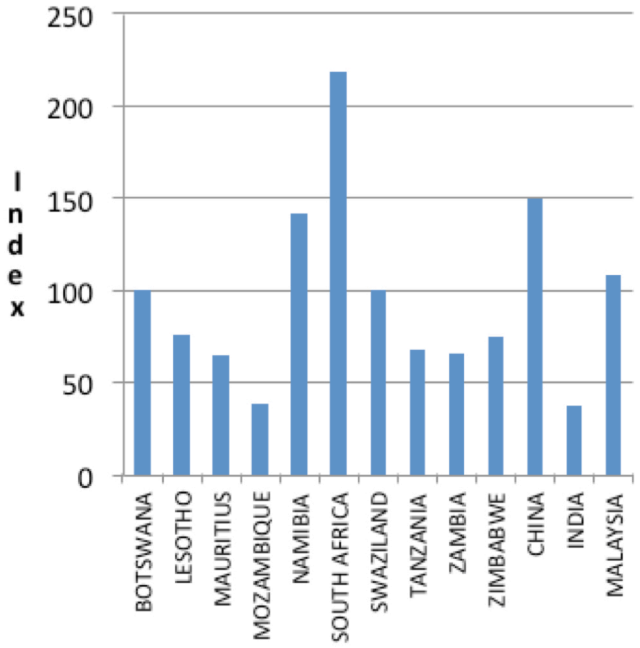
aforementioned costs are considerably higher in southern Africa. The charts below present the

Figure 4 (a & b) Index of Unskilled Wages (a) and Professional Salaries (b) in SADC and Asian Countries

(a)



(b)



Source: Economist Intelligence Unit (Custom Research) Survey, May 2012 NB: Index; (Botswana = 100)

differences in costs.

- Lack of commercial advantage. Having a gold mine in a country provides absolutely no source of commercial advantage to gold jewellery manufacturers because of required processing (refining). In Namibia for example, a country which produced 6.6 tonnes of gold for export in 2016 yet has no refinery and exports its gold for further processing in South Africa. Gold jewellery manufacturers in Windhoek report that they have to pay a 7% premium over spot price for fine jewellery delivered to Windhoek from South Africa. Therefore without a gold refinery, gold mining is not a source of a commercial advantage down the value chain. In the case of South Africa who has a gold finance policy, goldsmiths training program, Jewellery makers, designers as well as the most significant domestic market in Africa and has abundant supplies of gold, diamonds and platinum and has had them for over a century has not been able to develop an internationally competitive jewellery industry. With domestic demand in South Africa catered for by imports of as much as 80-90% of gold Jewellery according to industry sources.

- The alternative in artisanal gold, time frame and significant investment. Artisanal gold jewellery manufacturing may provide a basis for some downstream processing of gold but is not likely to give rise to a sector with considerable employment effects in the medium term. It also requires significant investment by government in refining capacity, transport and storage capacity; training, incubator and mentoring schemes; gold financing programs, hallmarking, web development and IT enhancement. This constitutes a significant investment by government and the experience from South Africa suggests that only a small percentage of those trained in the area of gold jewellery design and production find employment.

2) Lateral Tax Linkages

There have been two principal benefits that are seen by governments from the existence of large-scale gold mining (LSGM) operations in their

jurisdictions. First, gold has been recognised as a source of dynamic and technically sophisticated employment for the local population. This benefit may shortly be eroded almost entirely by the effects of the application of artificial intelligence in the mining sector which will lead in turn to fully mechanisation of the mining process. It is estimated that the full mechanisation of the mining sector will result in some 200,000 job losses in the SADC region alone[16]. Second gold mining has provided substantial fiscal benefits for countries but three incidents in the last 2-3 years suggest that governments in sub-Saharan African are achieving a less than optimal linkage between the gold mining operations and the level of tax flows. These include:

i. The Acacia (Barrack Gold) -Tanzania gold dispute

In early March 2017, the Tanzanian Ministry of Minerals issued a press release banning the export of gold-bearing concentrate and arguing that the concentrate should be exported in a more processed form[17]. In late March 2017 the President of Tanzania, Mr Magafuli paid a very public visit to the port of Dar Es Salaam to inspect some 277 containers of concentrate that were held there pending approval of authorities[18]. There were two Presidential Committees, the first of which in May 2017 concluded that the shipment in the Port of Dar Es Salaam contained levels of gold that were approximately ten times that which Acacia had declared. Acacia stated that it was not given a full copy of the report[19]. In response to the findings, Acacia issued a press release saying[20]:

Acacia's verified data shows that the 277 containers at Dar Es Salaam port contain 26,000 ounces of gold in total. Each of these containers contain on average around 3 kg (around 100 ounces) of Gold, 3 kg of Silver and 3,000 kg of Copper. The Committee's findings were that the gold content of these containers, which represent one month's production, totalled 7.8 tonnes (or 250,000 ounces). In 2016, Acacia produced and sold 250,000 ounces of gold in concentrate from these two mines in the whole of the year.

'The Committee's findings imply that Bulyanhulu and Buzwagi each produce more than 1.5 million ounces of gold per year. This would mean they are the two largest gold producers in the world; that Acacia is the world's third-largest gold producer; and that Acacia produces more gold from just three mines than companies like AngloGold Ashanti produce from 19 mines, Goldcorp from 11 mines, and Kinross from their nine mines.'

The results were widely dismissed in mining circles[21] and even amongst those who were broadly sympathetic to Tanzania's position and the obvious need for reform of its mining tax regime[22]. The failure by Tanzania to present the results publicly along with technical annexes and to be completely transparent only served to worsen investor perceptions of the country.

However, this apparently irrational dispute conducted in an opaque manner has its origins in the mining tax regime imposed on Tanzania in the 1990's by the World Bank. As late as 2016 after many years of operations, Acacia's two mines Bulyanhulu and Buzwagi, which together produced some 450,000 oz of gold in that year paid no company tax. Both mines have been in operation since 2001 and 2009 respectively and have paid no company tax while producing a total of 4 million oz of gold[23]. This experience is not only the case with Tanzanian gold but also the situation as it pertains to Zambian copper that we see poorly designed mining tax regimes of the 1990's resulting in a cycle of state – company disputes that have been referred to broadly and dismissively as 'resource nationalism'. These poorly designed laws drafted as they were during the period of 'high globalisation,' i.e. 1995-2005 resulted in an unstable commercial environment that has harmed both investors and governments.

The mine owners responded to the obvious need to negotiate another agreement with Tanzania to resolve the dispute. To that end Barrick the majority of Acacia moved to begin negotiations with the Tanzanian government. On October 17th, 2017 Barrick Gold Corporation announced that the Company and the Government of Tanzania have agreed on a framework[24] for a new partnership between Acacia Mining plc and the Government of Tanzania, whereby economic benefits generated by Acacia's operations would be shared with Tanzania

on a 50/50 basis going forward. Barrick Gold Corporation provided the following details concerning the proposal for a new, 21st-century partnership with the Government of Tanzania. At the time of writing the negotiations between the Government of Tanzania and Barrick Gold are on-going.

By May 2018 there still had been no formal agreement between the parties to a revised taxation regime for the effected Acacia owned mines in Tanzania. In May 2018 the Government of Tanzania revoked a retention license held by Glencore and Barrick Gold. The licence for the Kabanga nickel project in northwestern Tanzania, which was among 11 retention licences cancelled by the government under the Mining (Mineral Rights) Regulations of 2018[25].

ii. UNCTAD – RSA Chamber of Mines Gold Trade Dispute over Illicit Financial Flows

The second recent international dispute in the gold sector has surrounded the publication of a report in 2016 by UNCTAD on trade misinvoicing entitled 'Trade misinvoicing in primary commodities in developing countries: the cases of Chile, Cote d'Ivoire, South Africa and Zambia'[26]; which tried to address and shed light on misinvoicing among mining companies. The study used the UN Comtrade database, from which it compared reported exports by product and country destination with the reported imports of the products by those same countries. The study found huge discrepancies between export values reported by the exporting countries and import values in the importing countries of the same product. Over-invoicing was found in Chile (copper), and both over and under-invoicing of the same product in different years-Nigeria (Oil), Zambia (copper) and South Africa (silver and platinum). The report stated that the companies had misappropriated as much as 67 percent of export revenue in the countries studied. For South Africa, the report calculated cumulative under-invoicing over the period 2000-2014 to have amounted to USD 102.8 billion: USD 600 million (iron ore); USD 24 billion (silver and platinum); and USD 78.2 billion for gold. From which one of their main conclusions was that gold was deliberately being smuggled out of South Africa (even though their report claims this is not possible by just looking at the data) [27].

In response to this, the Chamber of Mines in South Africa commissioned Eunomix research to scrutinise the report. Unsurprisingly given the weakness of African trade data, they found conflicting results to those of the UNCTAD report. They acquired their data from Statistics SA, SARS and the Chamber of Mines that is publicly available. Through which the found the gap between exports from SA versus imports from trading partners to be USD 19.5 billion and not USD 78.2 billion. They argued errors in reports with trading partners could explain this.

The above findings further 'substantiating' the calls by the South African Chamber of Mines for the UNCTAD report to acknowledge its shortcomings. Major criticisms of the report stem from the data source, the methodology that the UNCTAD report used and the conclusions that have been drawn. The methodology used in the UNCTAD report, in summary, was as follows[29]:

'Trade between two countries A and B are said to exhibit export misinvoicing when the value of exports from country A to its trading partner country B, as reported by country A, is significantly different from the value of imports by country B from country A, as reported in country B's data' - UNCTAD (2016).

Upon scrutiny, it was found that the methodology used had severe limitations that led to flawed conclusions on the purported missing gold. In regards to the data source and methodology, the United Nations Statistical Division (UNSD) cautioned against straight country to country analysis due to amongst other reasons: different trade statistics reporting systems; country of origin versus country of destination; Free On Board (FOB) and Cost, Insurance and Freight (CIF) differences. However, these issues were something the UNCTAD report "omitted" [30].

Institutions such as International Financial Integrity which undertake a regular analysis of these issues of commercial malpractice suggest that gold data from South Africa is so poor that no real conclusions can be drawn[31]:

'....irreconcilable issues in the destination reporting of Zambia's copper exports and South Africa's gold exports distort bilateral estimates of misinvoicing to such a degree that bilateral estimations of misinvoicing for these countries are of little practical use.'

Another flaw in the UNCTAD study was pointed out by SARS that, 'in the case of SA and some others there are large differences between the declared export and the final product at the destination, therefore, the analysis of the UNCTAD report should not have blankly generalised the issue that the difference between the exports and arrivals represented mis-invoicing'[32].

The shortfalls of the report cannot be ignored. However, it does bring to light huge discrepancies by authorities and monitoring agencies (where they may be some) that cannot be swept under the rag due to methodological issues as even the reports debunking it shows that even though the losses are not as severe, there are loses and reasons behind them need to be scrutinized. As the UNCTAD Secretary-General (Dr Kituyi, 2017 as reported by fin24) argued[33], 'Just making a blanket statement to say a report by the United Nations Conference on Trade and Development (UNCTAD) on mis-invoicing in South Africa's gold industry is not true is not the solution as it does not take away the fact that mis-invoicing is taking place.'

The mining industry has historically been secretive with subsidiaries operating in several jurisdictions, and transactions commonly occurring through tax havens and other jurisdictions where secrecy provisions are prevalent. Therefore, to know what transpires in such commercial transactions is not possible. However, these companies in the past have been known to use various tools to maximise profits of which misinvoicing is one. As alluded to in the UNCTAD report, merely looking at the data does not show whether there is over-invoicing or otherwise. Therefore, it is imperative that countries, in particular developing countries take the issue seriously. Monitoring agencies and governments need to know; the magnitude of deposits (commodities) they have, how much has been extracted, what is being traded, where it is exported. Unlike the case of Zambia's and Namibia's copper that is recorded as going to Switzerland but are not recorded in Switzerland's imports, these must be appropriately registered so that gains from trade are shared equally to ensure that mining companies pay the taxes they ought to and not avoid taxes using mis-invoicing.

iii. Smuggling of Gold in West and Central Africa

Not only are the issues that pertain to fiscal policy limited to the discrepancies aforementioned as was the case with the UNCTAD study dispute with SARS and the on-going Acacia dispute in Tanzania but also the lack of harmonisation of tax policies and a lack of substantial protection of the frontiers. The lack of alignment of tax policies and weak frontiers are highly prevalent issues on the continent. The continent is rife with several tax policies in principle to attract FDI and extract rents from the sector. However, it is noted that it is this difference in tax policies that have contributed in part to the creation of illicit conduits and or hubs in the trade of minerals (particularly gold in this instance).

There are several cases of countries being smuggling hubs coming to light and attributed to the shortcomings mentioned above among others – more so in the ASM/ASGM sector. One such example is that of Mali, in which a new study found that Mali's export tax laws have turned it into a conduit for the export of West African gold to the UAE[34]. ASM/ASGM is largely an informal sector, partly due to its lack of recognition in comparison to hard rock mining. However, ASM/ASGM extracts considerable revenues and provides substantial employment (amount over return for certain parties involved). However, it is the nature of the practice that is one of its shortcomings. In part due to its informal nature, the ASGM sector provides little reliable data on gold production and trade, with an instance of official data indicating production values of 4 tonnes per year, whereas government statistics reported 20.4 tonnes in 2013 – a majority of which is believed to have been smuggled out of Mali[35]. Even with some form of harmonisation between Mali, Côte d'Ivoire and Burkina Faso of a 3% export tax on gold,

Mali's export policy of applying tax to only the first 50kg of gold exported per month – among other issues have made the country a central hub for smugglers from neighbouring countries. This is creating a loss of tax income to its neighbouring countries as well as itself. Other discrepancies highlighted include: Mali's declaration of 40 tonnes of gold production for 2013, but the UAE alone imported 49.6 tonnes from the country in the same year and in 2014, whereas Mali declared 45.8 tonnes – the UAE imported 59.9 tonnes. In regards to Artisanal mining (particularly), it was estimated that the country's artisanal mining sector produced around 36 tonnes of gold per year (significantly more than the 23.7 tonnes officially documented) [36] in 2016.

A lack of policy harmonisation is further illustrated as Sierra Leone's export tax on gold (unprocessed) – 3%[37], whereas its neighbour Guinea – on the export of the artisanal production of gold is at 1%. The aforementioned among other issues (another issue being differences in processing advancement and capacity) being attributed to why minerals, in particular, gold is "smuggled" from Sierra Leone to Guinea.

This issue is not unique to the aforementioned cases but is prevalent across several countries and regions across the continent and globe[39]. This further highlights the need for the formalisation of ASM/ASGM – though several countries have seen improvements by amending their mining codes and recognising ASM/ASGM. This has however had little impact as there is still uncertainty over actors along the value chain of ASMs that has left room for exploitation.

3) Backward Linkages and Economic Polarisation

The developments of down-stream processing, i.e. beneficiation, as well as lateral and backward linkages, are not mutually exclusive policy objectives, but they are often seen as competing concepts. It is entirely possible to pursue, where commercially viability can be demonstrated, forward and also backward linkages simultaneously. What will determine the viability of a particular policy direction will depend entirely upon the stage of development of a country with regards to mining and the economies of scale that are achievable with the development of new mines.

The size of the African market for capital goods and mining feedstocks for the gold sector is depicted below. It has been estimated by extrapolating based on the volume of ore in the sector as compared to the entire sector.

Table 1: Estimation of African Mining and Gold Mining Capital Goods Market (Mt & US$ mn)

Country	2013 All ore production, Mt	2013 Gold ore production, Mt	Gold ore as % of all ore	2013 Mining Cap Goods Import Value Million USD	Estimated Value of Mining Cap Goods Imports for Gold Mining, Million USD
South Africa	328.984	114.973	35%	2509	877
Ghana	57.811	55.999	97%	656	636
Burkina Faso	23.24	23.24	100%	244	244
Cote d'Ivoire	11.596	8.596	74%	211	156
Tanzania	22.859	15.744	69%	214	147
Mauritania	42.89	16.89	39%	360	142
Mali	18.205	18.205	100%	102	102
Guinea	17.994	17.994	100%	43	43
Zimbabwe	12.817	2.083	16%	215	35
Senegal	23.073	3.073	13%	151	20
TOTAL AFRICA	~1000	~300	~30%	~$16 billion	~$5 billion

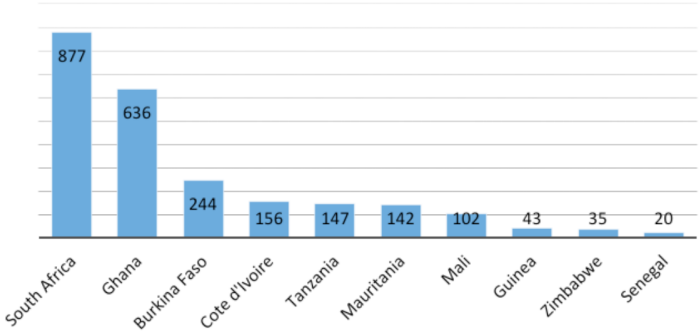
Notes: Countries that produced above 2 Mt of gold ore in 2013, Import data for Mali is for 2012, 2013 not available, Ore production data is from Raw Materials Data, Mining Capital Goods import data is sourced from Comtrade via www.trademap.org, in November 2017, Mining Capital Goods import data includes imports from all countries, for products referred to by the HS Codes. HS Codes selected also supply other sectors.

Ore production is a reasonably good proxy for the relative size of the mining inputs market/demand (the more ore mined, the more mining machinery, explosives, detonators, grinding media, chemicals for concentration, smelting/refining plant equipment and consumables, etc.) [41]. In 2013 Africa extracted about 1000Mt of ore (excluding coal) and about 300Mt of gold ore (RMD/SNL, 2015). Consequently, gold mining represents about 30% of all mining in Africa, ex-coal mining (about 150Mt in 2013), and probably represents roughly 30% of the continental

mining & processing inputs market. African imports from ROW (rest of world) of a selection of mining inputs capital goods and consumables are presented in Table 1. However, many of the articles are also used in other sectors such as construction (dump trucks, dozers, et al.) and water (drilling, valves, pumps, et al.). Africa's imports of the selected capital goods run at $13 to $16bn/an. As the selection excludes numerous inputs, particularly services and consumables (such as fuels and lubricants), the actual imports into the mining sector are probably well above $20bn/an.

African gold mining/processing imports of the select capital goods inputs are graphically presented in Figure 1, led by SA and followed by Ghana, Burkina Faso, Cote d'Ivoire and Tanzania. However, it is important to note that gold mining inputs are shared with other types of hard rock mining, and thus the potential market for developing the African minerals backward linkages capital goods sector is more in the order of $15bn per annum.

Figure 5: Estimated Gold Mining Capital Goods Imports for Select States (2013, US$mn)



Notes: Countries that produced above 2 Mt of gold ore in 2013. Source: table 1.

The development of linkages can be increased by local involvement at various stages along the value chain. Government's first need to consider the actors involved before the mine is constructed. One of the most serious policy lacunas has been the failure to recognise the central role that the very bottom of the gold value chain can play in the economic transformation of African countries. Government policy measures about mining usually begin after the development of the mine itself and this in effect means that governments in Africa are failing to extract a significant portion of the economic benefits earned by investors when they seek and develop new deposits.

This section considers the policy measures needed to pursue backward linkages into services and mining feedstock in light of what would almost certainly be serious economic polarisation resulting from such a minerals policy. Policy can be pursued at a national level, but with the possible exception of South Africa, no country in Africa alone has a sufficiently large mining sector to justify the development of backward linkages based on national demands. It is for this reason that what follows is based on a regional approach.

However, a regional approach immediately leads to economic polarisation. Economic polarisation, where production tends to be concentrated in what is commonly the economically largest entity, i.e. South Africa in the case of SADC or Nigerian, Senegal or Cote d'Ivoire in ECOWAS. Polarization has been at the heart of the slow pace of trade integration as regional member countries of the eight African economic communities see little immediate economic benefit to be derived from integration as all employment and production benefits are seen to flow to South Africa or other similar large economics.

REC Mining Inputs and Key Feedstocks Common Market

The creation of backward linkages will require the creation of a common sectoral market for mining feedstock. REC markets for backward linkages are theoretically significant but need to be realised through the creation of regional common markets for these products, with outer tariff barriers of around 10% (sectoral customs union), for regional strategic mineral feedstocks (minerals/metals, semis/intermediates and mineral/metal-based articles) as well as mining inputs. This will give all RMCs the advantage of the large regional markets but will require well-crafted interventions to support less developed states that would have difficulties in taking advantage of these opportunities.

The mining inputs markets of all RMCs, except to some extent SA, are too small to sustain viable-scale mining inputs industries. The largest market, after SA, is Zambia at around 10% of the African market. Consequently, a ring-fenced national RMC strategy has insufficient potential, due to the ever-increasing economies-of-scale of production, requiring larger markets. It is worthy of note that the EU started with a sector limited agreement in 1950 (Shuman Plan-Paris Agreement) for coal and steel only – European Coal and Steel Community (ECSC) – then moved to greater integration in 1959 (Rome Agreement).

The African REC markets for mining inputs are significant and growing faster than most other regional market sectors (it has grown at roughly the same rate as the mining sector). However, in many senses this "regional market" does not exist, in that RMCs that have mechanisms to support local content, reduce other RMCs to the status of overseas competitors (e.g. China, EU or NAFTA) in terms of tariffs, local content, etc. Consequently, for RMCs to realise this substantial mining inputs market, a system of regional-local content credits, which caters for RMC variable geometry, within a REC strategic MVCs common market, needs to be developed and adopted by participating RMCs.

Regional-Local Content Provisions in all RMC Mining Licenses

The creation of a regional common market is in itself insufficient to stimulate the development of a relatively capital and knowledge-intensive backward linkage sector, and the commercial co-operation of mining houses is also essential. The first step is for all RMCs within the REC to make provision for local content targets in all mining licenses/leases, which may require the amendment of mining laws and regulations. These targets should be disaggregated into a capital goods target, a consumables (excluding energy/liquid fuels and water) target and a services target, because a global "local content" target will result in the companies concentrating on localising services (the easiest to achieve) at the expense of industrialisation (capital goods and consumables).

The local content targets should recognise regional content at a discounted rate (inverse of the RMC GDP/capita) under a regional-local content system (R-LC). Regional supplier R-LC eligibility in any participating RMC should be inversely discounted according to the RMC "richness" (1/GDP/capita) with the wealthiest participating RMC counting 50% and the poorest 90%, towards the mining and processing R-LC targets of another participating RMC. Besides, all other African countries (ex-REC concerned) could count 50% towards an RMCs R-LC targets. The host RMC local content would always count 100% towards its R-LC targets (or more, with an indigenisation multiplier).

Further, in order to gradually build national RMC capital in the region and to correct the skewed colonial-settler legacy in the ownership of mining and mining inputs firms, there could also be a 10% (1.1) multiplier for goods or services produced or supplied by firms that are majority-owned (>50%) by indigenous individuals/entities. The precise definition of “indigenous” could be determined by the RMC, to take into account each country’s particular history. Using SADC GDP/capita in 2015 in 20,), the highest R-LC eligibility would be for Malawi (90% credits) and the lowest for Mauritius (50%)[42]. South African suppliers would be credited with 61% of local value addition (or 67% if >50% indigenous owned) and Mauritian 50%[43].
With regional supply in play, albeit discounted, the R-LC content targets could be set at:

- 80% for services,
- 70% for consumables (excluding utilities and liquid fuels & lubricants) and
- 60% of capital goods.

These could be reasonably stretched every 5-10 years, as the REC mining inputs supply capacity is progressively built. The target milestones (e.g. 50% by year t1, 100% by year t2) could be left to the discretion of the RMCs to customise for particular mines or projects (in general, mines in production for longer would have to comply quicker and new mines/projects would be given some leeway).

The onus of certifying R-LC (VA) would be on the mines, and it should form part of their annual financial audit. Consideration could be given to exempting ASM from R-LC obligations/targets (mines with less than 15kt/month ore milled = 180kt/an).

Table 2, below, gives the same eligibility for regional-local content based on the inverse of GDP/capita for another REC, ECOWAS, with the highest being for Niger (90% recognition in other RMCs) and the lowest for Cabo Verde (50% recognition in other RMCs).

Highest GDP/cap counts 50% and lowest 90% towards local content targets, Rest of Africa (RoA) 50%; Rest of World (RoW) 0%

Managing Variable Geometry[44]

One unavoidable aspect of trade and economic integration is economic polarisation. In part what has been suggested above is meant to address the issue of polarisation through the weightings on local content requirements. This would however not be sufficient. This is the "normal" initial impact of regional economic integration where the historically

Table 2: Possible ECOWAS Regional-Local (R-LC) Content Recognition (1/GDP/cap)

Country	2013 All ore production, Mt	2013 Gold ore production, Mt	Gold ore as % of all ore	2013 Mining Cap Goods Import Value Million USD	Estimated Value of Mining Cap Goods Imports for Gold Mining, Million USD
South Africa	328.984	114.973	35%	2509	877
Ghana	57.811	55.999	97%	656	636
Burkina Faso	23.24	23.24	100%	244	244
Cote d'Ivoire	11.596	8.596	74%	211	156
Tanzania	22.859	15.744	69%	214	147
Mauritania	42.89	16.89	39%	360	142
Mali	18.205	18.205	100%	102	102
Guinea	17.994	17.994	100%	43	43
Zimbabwe	12.817	2.083	16%	215	35
Senegal	23.073	3.073	13%	151	20
TOTAL AFRICA	~1000	~300	~30%	~$16 billion	~$5 billion

Highest GDP/cap counts 50% and lowest 90% towards local content targets, Rest of Africa (RoA) 50%; Rest of World (RoW) 0%

stronger economies initially benefit disproportionately from the broader regional markets[45]. Consequently, instruments would need to be created that advantage the less developed RMCs to become more attractive locations for mining inputs production capacity for the regional (REC) markets.

Nevertheless, the main advantage of regional common markets would be to progressively displace extra-REC imports from the rest of the world, with REC products of requisite quality and price. Imports of mining inputs (capital goods, consumables & services) are probably in the order of $20bn - $30bn/an (~30% into gold mining & processing). Accordingly, the realisation of the African REC mining inputs markets is not a zero-sum game but should be a win-win strategy, with all RMCs gaining a share of the displaced extra-African imports. However, due to the economic polarisation effect, the more developed economies would initially "win" disproportionately, and thus strategies to overcome this are needed.

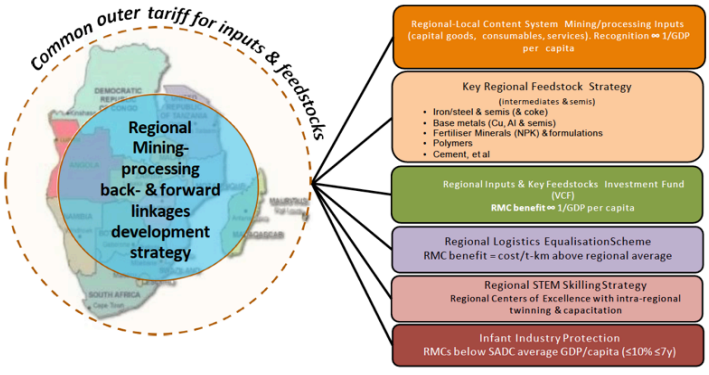
Several such REC strategies are suggested, mainly based on RMC GDP/capita, which has the advantage of self-adjusting to success, in that if the poorest RMC received most of the investments, its GDP/capita could increase considerably and the instruments would become progressively less favourable/ attractive for that RMC.

The six principal instruments are suggested to develop a regional industry (proposal 1&2 below) and the remaining instruments are ways of channelling resources to the least developed and most disadvantaged members of a particular REC:

1. Time-bound Infant Industry Protection: This concession would permit any RMC to impose a tariff of up to 10% on intermediates, semis and

Figure 6: Conceptual Key Elements of an African REC Backward Linkages Strategy

Regional Mining Vision (RMV) RBI Strategy



RMC: Regional Member Country

inputs imports from other RMCs for up to 7 years on new projects that conform to the regional strategy, to ameliorate the extra costs borne by new plants (capex servicing, workforce training, et al). The import tariff would be from 0% to 10% depending on the RMC GDP/capita. Such an RMC infant industry tariff would be added to the outer, REC, tariffs on the intermediates /semis concerned for extra-REC imports.

2. Regional-local content (R-LC) targets in all RMC mining licenses, which also recognise local content from other RMCs, but discounted proportional to their GDP/capita, from 50% eligibility (richest RMC) to 90% (poorest RMC) and 50% eligibility from the rest of Africa.

3. A regional Venture Capital Fund (VCF) that will fund pre-feasibility studies (PFSs), debt and take up to 49.9% equity in investment projects: PFS funding 0-90%, debt funding 0-90% and equity 0-49%, depending on the GDP/capita of the participating RMC, with a possible multiplier for >50% indigenous-owned projects.

4. A regional (REC) logistics equalisation scheme: Regional mineral-based intermediates and semis producers (products >90% regional VA) and inputs manufacturers (>65% regional VA) that incur higher logistics costs in supplying the regional downstream intermediates and semis markets and inputs markets, could be partly compensated, for intra-RMC logistics costs in excess of the weighted average RMC intra-regional logistics cost/t-km.

5. Other RMC mining license obligations such as a minimum local STEM skills corporate spend (>5% payroll) and minimum local RDI spend (>0.5% of sales) would also include regional expenditures, but discounted according to the RMC GDP/capita.

6. 6) Fiscal RMC instruments that reduce according to local VA such as lower royalties on more processed products, a RRT-VA[46] offset system or export taxes on unprocessed minerals (e.g. concentrates). These could all recognise regional VA, but discounted Recent studies have indicated astounding illicit financial flows from Africa[47] (~$60bn/an) mainly through transfer pricing (especially over-invoicing of costs), particularly the extractives sector. It is more difficult to over-invoice R-LC (similar tax jurisdictions) and almost all the transfer pricing (over-invoicing of costs) originates ex-Africa, meaning that a strategy of increasing R-LC will also have a collateral positive impact of curtailing illicit financial flows.

STEM Skills and Technology Development

Leaving aside the not inconsiderable political constraints to such a comprehensive regional approach to the development of backward linkages the greatest single technical challenge will come from an inadequate supply of STEM Skills and RDI capacity in almost all African countries. These are pre-requisites for developing a competitive mining inputs sector. In this regard all REC RMCs could consider:

1. Making provision for a minimum STEM skills corporate local spend of 5% of payroll (with discounted regional spend credits) in all mining licenses/leases;

2. Making provision for a minimum RDI corporate local spend of 0.5% of sales (with discounted regional spend credits) in all mining licenses/leases.

Expenditure of 5% of payroll on HRD and 0.5% of sales on RDI is now SIB (stay-in-business) figures for responsible mining companies, so the issue is only whether they spend it in the RMC/REC or overseas. Expenditure in other REC RMCs could be credited at a discounted rate (as per R-LC) from 50% to 90%, inversely proportional to RMC GDP/capita to slowly build regional Centres of Competence in STEM skilling (engineering, science, trades/artisans, technicians, et al) and RDI (mining, concentration, smelting, reefing, semis, fabrication). Almost all RMCs have skilling capacities in their universities, colleges or training centres (earth science, engineering, science, artisans, technicians, et al) which could be candidates for regional training centres (e.g. the Schools of Mines in Bulawayo and Guinea).

The mining license STEM skilling and RDI provisions, together with discounted regional credits, should provide the requisite basis for regional universities, colleges and institutes to compete on a roughly equal footing for the mining company expenditures, and to progressively build niche centres of regional competence.

Whether there exist the political will to implement such a comprehensive program regionally remains in question. However, without either the investment in forward linkages or a program that will develop lateral and backward linkages African countries will lose what is the most dynamic employment generating sectors without an obvious replacement.

Conclusion

The prospects for the beneficiation of gold, i.e. downstream processing into the only labour intensive component of manufacturing i.e. jewellery manufacturing is, for most African countries, not commercially propitious. Gold jewellery, except India and China, is a luxury commodity in decline amongst the generation of Millennials. The only two major markets where gold jewellery consumption exhibits strong growth is in India and China which are the two largest and most competitive producers of gold jewellery. Most SADC countries cannot compete with India and China in terms of unskilled and professional labour costs. In terms of lateral taxation and revenue benefits, there is an increasing number of studies of illicit financial flows, as well as accusations of gold theft and fairly substantial evidence of smuggling of very large volumes of gold to the UAE, i.e. Dubai. These all suggest that there are considerable benefits to be derived by member countries of regional economic communities in dealing with these taxation and border issues regionally and co-operatively.

Lastly, the possibility of establishing backward linkages is also constrained by the fact that no country alone, not even South Africa has a sufficiently large market for mining feedstocks as to support a national policy based on establishing or strengthening domestic production in this area. Only through a regional co-operation that recognises the inherent cost disadvantages of smaller and landlocked members, i.e. the issue of economic polarisation, can the development of backward linkages to mining be effective as a means of development. The approach proposed deals with the issue of polarisation but at the political cost of requiring unprecedented levels of regional co-operation of African states to create a regional mining feedstock community. It also has the economic consequence of raising the cost of mining in Africa relative to other regions. Thus leveraging Africa's increased gold production for economic transformation is trapped between the economic rock of African lack of competitiveness which pervades all sectors, and the political hard place of African regional co-operation.

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neighboring countries. Sahara Royal Gold Refinery - Ghana has a reported capacity of 300kg/day ie 90 tonne capacity which the company's official website indicates is a starting point and the intention is to increase throughput to 500kg/day. Sudan Gold Refinery located in Al-Hila Al-Jadida area north of the capital Khartoum, was opened in 2012, its production capacity was 900 kilograms of gold a day. Fidelity Printers and Refiners (FPR) - Zimbabwe The Reserve Bank of Zimbabwe owned refinery is reported to have processed 21.4 tonnes of gold in 2016. Fidelity Printers had LBMA accreditation. On 30 June 2008 Fidelity Printers and Refinery was expelled from the LBMA because of failure to produce a minimum of 10 tonnes per year. Mali Refineries – Two refineries exist in Bamako, Mali with a reported combined capacity of 55 tonnes per annum. Reportedly Swiss Bullion Co., owns the 100-kg-per-day Moussa Kankou refinery. The second refinery, owned by Marena Gold, has a capacity of 50-kg per day.

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40. HS Codes: '843143 Parts of boring/sinking machinery; '870410 Dump trucks (off-highway); '842952 Shovels & excavators 360°; '842959 Self-propelled excavating machinery; '847490 Parts of concentration machinery; '843041 Boring/sinking machinery, self-propelled; '842911 Bulldozers and angledozers; '847420 Comminution machinery; '730840 Pit-props & similar equipment; '847410 Concentration machinery; '820719 Parts for Rock drilling/earth boring tools; '820713 Rock drilling/earth boring tools; '841710 Furnaces & ovens non-elec for roast, melt/heat-treat of ores, metals; '360300 Detonation fuses, caps, igniters; '732591 Grinding media; '843031 Coal or rock cutters, self-propelled '845530 Rolls for metal rolling mills; '843141 Buckets, shovels, grabs and grips of excavating machinery; '845590 Parts of metal rolling mills & rolls; '360200 Prepared explosives, o/t propellant powders; '845490 Pts of converters/ladles/ingot mould & casting machinery; '845420 Ingot moulds & ladles used in metallurgy; '843039 Coal or rock cutters, not self-propelled; '845522 Cold metal

rolling mills; '845521 Hot or hot & cold metal rolling mills; '845430 Casting machines used in metallurgy; '845410 Converters used in metallurgy; '845510 Tube mills, metal rolling;

41. From 2001 to 2013 capex averaged ~20% of sales (turnover) on SA mines (StatsSA 2015)
42. Seychelles were zeroed (=50% eligibility) due to its outlier GDP/capita ($16k: distorts the range) and its lack a mining sector.
43. The indigenous multiplier would presumably not apply to Mauritius as it was unpopulated when colonised (by the Dutch, French, then British)
44. Variable geometry refers to the differential application of rules and disciplines based upon divergent levels of RMC industrialization, development, HDI, et al
45. E.g. Brazil in Mercosur, the US in Nafta and, to some extent, Germany in the EU.
46. Resource Rent Tax rate reduction in exchange for greater mineral Value Addition (see CMV, 2014).
47. GFI 2014 "Illicit Financial Flows from Developing Countries: 2003-2012", Dev Kar and Joseph Spanjers, Washington

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