

Illicit Financial Flows, Theft and Gold Smuggling in Africa

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Abstract

The article reviews recent research and controversies surrounding the quantification of illicit financial flows (IFF) in the gold mining sector in Africa. It is argued that the methodology and data used in the quantification of the most frequently analysed technique, i.e., export undervaluation, is flawed not only because of the recognized weakness of the international trade data, but also because it focuses only on one aspect of IFF, and does not attempt to address issues pertaining to actual under-measurement or misspecification of volumes. It is argued that estimates of tax evasion activities can only be determined through forensic economic and accounting techniques, and not through macro-economic or trade data. The last section considers the increased evidence of gold smuggling to the UAE from various African countries, some of which produce no gold of any significance, but appear to export in very large volumes; and at unit import values well below world market prices.

Keywords: *transfer pricing, illicit financial flows, gold mining, smuggling, Africa*

1. Introduction and Background

This article aims to review the methodology and conclusions derived from numerous recent international studies on the magnitude of illicit financial flows (IFF) in the African mining sector, with a particular emphasis on gold production and trade. It first considers two apparently separate issues and controversies related to the IFF of gold from the continent. This includes the dispute between the United Nations Conference on Trade and Development (UNCTAD) and the South African Chamber of Mines over estimates of under-invoicing of gold, in which the so-called Bhagwhati method of measuring IFF is central; second, the Acacia Mining plc (Henceforth is Acacia)-Tanzania dispute, which revolves around allegations of gold theft. It is argued that the methodology used for estimating the magnitude of IFF is inappropriate and the data too weak to draw the sort of conclusions that have been drawn by international organizations such as the UNCTAD, which have provided very large estimates of only one form of IFF in the gold mining sector. The use of trade data as per the Bhagwhati method to estimate IFF in effect implies that the vast array of techniques available to financially sophisticated mining companies to undertake base erosion and profit shifting (BEPS) are not considered.

The economic benefit derived by host African countries from mining ventures undertaken in their jurisdiction vary, but it is largely from taxes imposed by governments on them that host countries derive most of the economic benefits in comparison to other economic benefits such as formal sector employment. In Africa,

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states are heavily reliant on mining revenue, and minerals are frequently the main source of exports and production (Adu & Dramani, 2018; Ericsson & Löf, 2017). Several institutions have tried to quantify illicit financial flows with varying results (UNECA, 2015; Kar & Spanjers, 2015; Kar & Spanjers, 2014). These estimates have almost invariably been predicated on an analysis of only one form of BEPS, which is the under-invoicing of exports. There are many techniques available to companies to hide apparent profits if they wish to avoid or evade the payment of taxes. We will consider these various methods and will argue that the excessive focus on one, albeit important, technique of Transfer Pricing Methods (TPM) has distorted the entire debate on IFF. It is argued here that the attempts to determine the extent of IFF using trade data is flawed, and what is often an illegal transaction cannot be estimated at such a macroeconomic level. This can only be done using forensic accounting and economic techniques.

In the second section of the text, the Acacia Mining plc-Tanzania dispute, which revolves around allegations of gold theft, will be considered. By addressing this, the paper hopes more light will be shed from a different perspective on the dynamics of IFF and governance on the continent. The Acacia Mining plc has been accused of massively under-estimating the volume of gold in its concentrate exports. The dispute will be considered in detail along with the related issue of the failure of African governments to develop capacity or legislation to ensure that volumes of exports are verified. The last section also considers the issue of gold smuggling from West Africa, the Great Lakes, Libya, and Sudan to the UAE.

2. Methodology

The study, by and large, was a desk review exercise of the subject matter under discussion. The first section discusses illicit financial flows from the perspective of the dispute between the UNCTAD and the South African Chamber of Mines; and goes on to lay out the cause of the dispute, being the UNCTAD publication on trade misinvoicing entitled “Trade misinvoicing in primary commodities in developing countries: The cases of Chile, Cote d’Ivoire, South Africa, and Zambia.” It then goes on to give the South African Chamber of Mines’ perspective while underlying the shortfalls of the much utilized Bhagwati method of estimating IFF, before recommending issues of consideration when measuring illicit financial flows. The section on the UNCTAD dispute also reviews the methodologies and conclusions derived from numerous recent international studies on the magnitude of illicit financial flows in the African mining sector by reputable institutions. The second issue of controversy under discussion related to IFF from the continent is the Acacia-Tanzania dispute, which revolves around allegations of gold theft. Here, like in the first section, arguments from the respective parties involved are put forward before the article presents its perspectives and arguments.

Finally, the article discusses smuggling, another component linked to illicit flows. Under this section the article discusses the various occurrences of smuggling before going on to use Comtrade data for analysis. However, unlike the methodologies critiqued in this paper, the article does not look at mismatches of trade data but

rather highlights under-pricing of gold trade on the continent. We do this by collecting import values and volumes of gold from the UAE, and deriving unit import values of the top 26 countries that export gold to the UAE from the African continent.

3. Review and Discussion

3.1 UNCTAD and the South Africa Chamber of Mines Dispute

3.1.1 UNCTAD and UNECA Estimates of IFF –The Bhagwati Technique

In July 2016 UNCTAD released a report on trade misinvoicing entitled “Trade misinvoicing in primary commodities in developing countries: The cases of Chile, Cote d’Ivoire, South Africa, and Zambia” (UNCTAD, 2016); which tried to shed light on misinvoicing (under- and over-invoicing) by mining companies. The study used the UN’s Comtrade database, from which it compared reported exports by product and country destination; with the reported imports of the products by those same countries. It should be noted from the outset that this so-called Bhagwati method (Bhagwati, 1967; Bhagwati, 1964) of measuring IFF only highlights one form of IFF or transfer pricing, which is also the easiest to detect because arms-length prices are readily available. Transfer pricing, on the other hand, is much more difficult to detect when the chosen technique is capital cost escalation at the beginning of the project, precisely because the arms-length price for the construction of a mine is difficult to estimate. However, there exist numerous methods for estimating IFF (Yalta, 2009).

The UNCTAD study found very substantial discrepancies between export values reported by exporting countries and import values in 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 in Nigeria (oil), Zambia (copper), and South Africa (gold, iron ore, silver, and platinum). The report stated that as much as 67 percent of export revenue in the countries studied had been misappropriated by mining companies. For South Africa, the report calculated cumulative under-invoicing over the period 2000–2014 to have amounted to USD102.8bn: USD600m (iron ore); USD24bn (silver and platinum); and USD78.2bn (gold). One of the main conclusions of the UNCTAD was that gold was deliberately being mis-invoiced out of South Africa (even though their report claims that “distinction is not possible empirically”¹ (UNCTAD, 2016: 12).

The UNCTAD study methodology is criticized as the major flaw, more so given the issues of trade data from Comtrade—particularly in the South African case—given South Africa’s unique way of recording gold data for one. The methodology used suggests that misinvoicing is being practiced if “*Trade between two countries A and B is 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.*” (ibid: 12).

¹Though they allude to the distinction between the two cases of import under-invoicing (technical smuggling and pure smuggling), it should be noted that by merely observing macro trade data, not only are the issues of smuggling not detectable from each other but also from “legal/above board trade.

Prior to the UNCTAD study, the United Nations Economic Commission for Africa (UNECA) and the African Union (AU) undertook a similar study to analyse the phenomenon. They set up a High-Level Panel on Illicit Financial Flows study from Africa, inspired by an earlier GFI study. The UNECA/AU report also sought to measure the outflows due to IFF. The UNECA and AU estimated that illicit flows from Africa were approximately US\$50bn per annum (UNECA, 2015).

Just like the subsequent UNCTAD paper, UNECA used the Bhagwati methodology in that estimates were made using trade data for misinvoicing. Like the Trade Mispricing Model and UNCTAD study, the ECA methodology used bilateral data for the same trade flow, comparing country *Y*'s exports of product *A* to country *Z*, with country *Z*'s imports of product *A* from country *Y*. The UNECA study used data from the UN Comtrade database, which they argue allows for analysis at the product level, with data available for several nomenclatures as was the case with the UNCTAD study.

In the same vein, recent studies have also indicated exceptionally high IFF from Africa (~\$60bn/an) (Kar & Spanjers, 2014), particularly in the extractives sector. The Global Financial Integrity, which is a relatively technically competent non-governmental organisation (NGO), used mismatches in official trade data to estimate that trade misinvoicing drains approximately US\$800bn from developing countries annually (Kar & Spanjers, 2015).

Salomon and Spanjers (2017) allude to methodological issues and emphasize the fact that more analysis needs to be done in quantifying IFFs. They point out that mismatches due to delays in the export/import process, different recording practices and mismatches in reporting—just to mention a few—are some issues that cause legitimate discrepancies. They also allude to how mixing methodologies and accounting for certain factors provide some insights, but believe that estimates have been conservative given data issues and the complexity of illicit capital flows.

Estimates of IFFs can -- and do -- differ even with the use of the same methodology given the different assumptions made and data focus. This study is not oblivious to illicit capital flows/misinvoicing, but the magnitude is in dispute in South Africa. While the magnitudes may be questionable, they cannot just disappear without some form of ripples elsewhere in the financial records of the various publicly listed mining companies, as well as in the economy at large.

the GFI, on the other hand, has recognized some of the problems with its methodology, and that which is widely accepted in the international community. They note that in the case of Zambia, “... *irreconcilable issues in the destination of Zambia’s copper exports distort bilateral estimates of misinvoicing to such a degree that bilateral estimations of misinvoicing for these countries are of little practical use*” (Salomon & Spanjers, 2017; Forstater, 2017). In a relatively recent study for South Africa and Zambia, Salomon and Spanjers (2017) switch from bilateral trade comparisons to global trade comparisons. This eliminated the issue of ordinary trade being termed capital flight based on destination mismatches. However, for

most of the other countries in the study, the higher bilateral figures were still kept. They also introduced a new estimate that addresses the issue of double counting² in misinvoicing between countries. The changes resulted in the reduction of estimates of misinvoicing for both South Africa and Zambia. South African estimates dropped from \$21bn a year to \$7bn a year (between 2004 and 2013); and in Zambia from \$3bn to \$160m a year. Overall, their estimates of illicit flows from Africa fell from \$60bn to \$32bn. An important point to note is that there was a significant reassessment for South Africa and Zambia (which went from bilateral to a global approach), and that there was a significant upward reassessment of Algeria, Egypt, and Sudan (which went from global to a bilateral approach).

As Forstater (2017) asserts, “... *all this analysis shows is how sensitive the findings are to methodological choices, and to specific local knowledge.*” Furthermore, a significant point of contention is that the GFI analysis did not consider South Africa’s recording of data in their study of non-monetary and monetary gold (Forstater, 2017), which could have seen further changes in the estimates of IFF.

While methodological issues are acknowledged in the literature, they are often ignored when calculations are being made as is illustrated by the UNCTAD study, among others, even with caveats from the UN’s Statistics Division (UN Comtrade, 2016; United Nations, 2004; Ajayi, 1998). It must be reiterated for the sake of clarity that illicit financial flows almost certainly do occur, but the methods used to estimate the value of the phenomenon is flawed and lacks credibility, thereby undermining the IFF debate. The discrepancies in trade data do not necessarily imply smuggling or fraud as there are various legitimate reasons that may lead to such discrepancies. These include: differing definitions of exports and imports, differing definitions of territory, the timing of transactions, declarations of country of origin, exchange rates and/or currency conversions, valuation issues, differences in statistical territory definitions, product classifications, differences in data collection and/or reporting lags and partner country attribution, and re-exporting of goods and treatment of processing trade. Forstater (2017) suggested that what the UNCTAD report actually revealed is how ordinary trade patterns can be systematically converted into massive misinvoicing estimates. Thus, it is important that other estimation techniques are employed to quantify IFF.

3.1.2 South African Chamber of Mines Responses to the UNCTAD Report

In response to the UNCTAD report, the South African Chamber of Mines commissioned a consulting firm, Eunomix,³ to critically scrutinize the report (Eunomix, 2016). Eunomix sought to provide context and verify or discredit the allegations made in the UNCTAD report. Eunomix acquired data from Statistics

²The issue of double counting is better illustrated by the case of South Africa, who do not record imports of gold from its neighbouring countries that are refined in South Africa and then exported, as South African gold but rather as the source countries gold.

³Eunomix is a consultancy firm that was founded in 2009 that has since gone to become a reputed advisor with a deep focus on Africa. See: <https://eunomix.com/>

SA, SARS, and the Chamber of Mines: which are all publicly available and are all different. From this data, they observed what they claim is a little variance in volumes produced; yet after 150 years of gold production, no unique dataset for the value of gold production in South Africa exists.

Eunomix made comparisons and estimates between the Comtrade data and an average of the three sources of data from South Africa (which also included production data and not just exports – see Table 1). They found that the data from the South African sources varied, but not sufficiently in their view as to raise red flags. However, in comparison with the Comtrade data, they observed some convergence and major divergence in the period 2011–2014. Eunomix found the gap between exports from South Africa versus imports from trading partners to be USD19.5bn and not USD 78.2bn. This, they argued, could be explained simply by errors in reports with trading partners and a flawed methodology employed by the UNCTAD study. Among the reasons, it also pointed out that the UNCTAD report:

... failed to account for the complexities of international trade, for the differences between material and financial trade, for differing reporting standards and capabilities across countries and for the inherent risks of using single databases to document global economic phenomena. For instance, differences in reporting the destination country, in reporting re-exporting, in reporting the destination country in case of a shortage and in reporting destination country due to the existence of ‘virtual’ trading hubs (Eunomix, 2017: 7).

The UNCTAD study was also criticized by SARS (2016)⁴ and the entire matter was discussed in the parliament (Creamer, 2016).

The Eunomix study indicated that most of the gold discrepancies, which the UNCTAD study interpreted as misinvoicing, could be explained by South Africa’s recording of gold exports as ‘money’, while trade partners record the same gold bars as ‘non-monetary’ gold (non-monetary gold in the HS system is reported under codes HS710800-710813; HS7109; HS711230; HS711291, while monetary gold is reported in HS710820). The other significant discrepancies stemmed from the fact that gold that is imported from other countries and is refined in South Africa is commonly recorded as South African gold by trading partners. The only refinery in Africa with the London Bullion Metal Association (LBMA) accreditation is the Rand Refinery in Germiston. It maintains a level of secrecy in its commercial transactions that renders the understanding of trade in gold to and from South Africa virtually impossible.

Eunomix recognized UNCTAD’s efforts in UNCTAD’s ‘revised’ study, but found it to have limited corrections by comparing the imports of trading partners to be ‘non-monetary gold’ with South Africa’s exports of ‘non-monetary gold’, which saw the estimates fall from \$78.2bn to \$57bn for gold.

⁴ SARS argued 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 generalized the issue that the difference between the exports and arrivals represented mis-invoicing.”

**Table 1: South African Annual Gold Production/Exports
by the Data Source in Constant 2014 USD million**

Year	SOUTH AFRICAN DATA (SOURCE: EUNOMIX)				COMTRADE DATA			SOUTH AFRICAN GOVERNMENT DATA (DTI)			
	SARB (exports)	Stats SA (prod.)	Chamber of Mines (prod.)	Average, SARB, Stats SA, CoM	Non-monetary gold exports (partner data)	Non-monetary exports (SA data)	Non-monetary gold exports	Monetary gold exports	Unallocated non-monetary gold exports	Unallocated monetary gold exports	
2000	5,335	4,852	5,088	5,092	4,018.1	27.9	30.3	5,195.2	0.0	5,194.1	
2001	4,422	4,393	4,442	4,419	3,915.0	5.8	6.1	4,659.2	0.0	4,659.0	
2002	5,311	5,050	5,027	5,129	5,386.6	31.9	31.7	5,134.3	0.0	5,134.3	
2003	5,325	5,509	5,496	5,443	5,090.1	232.5	231.1	5,759.8	0.0	5,759.0	
2004	5,433	5,564	5,479	5,492	4,607.0	393.7	391.0	6,477.0	0.0	6,475.0	
2005	5,025	4,577	5,015	4,873	5,402.0	392.5	392.9	5,186.7	0.0	5,185.3	
2006	6,016	6,130	6,118	6,088	4,684.0	190.7	191.9	6,005.3	0.0	6,005.3	
2007	6,323	6,191	6,359	6,291	6,598.6	417.9	416.9	6,295.7	0.0	6,295.6	
2008	6,449	6,126	6,672	6,416	8,443.6	202.5	200.4	6,435.9	0.0	6,431.8	
2009	6,807	6,375	6,940	6,707	5,091.1	217.7	432.7	13,563	0.0	13,563.2	
2010	8,736	7,824	8,244	8,268	6,524.9	246.7	515.0	17,874	0.0	17,873.9	
2011	10,936	9,925	10,119	10,326	12,868	11,188	18,759	3,547.1	18,205	3,547	
2012	8,951	9,701	9,247	9,300	14,254	9,166	23,792	0.0	23,221	0.0	
2013	6,739	7,421	7,687	7,282	16,649	6,925.1	11,034	0.0	10,717.5	0.0	
2014	5,778	5,846	6,464	6,029	13,123	4,865.9	5,912.3	0.0	5,773.2	0.0	
Total	97,586	95,485	98,396	97,156	59,761	2,359	2,840	82,586	0.0	82,576	
2000-2010					56,893	32,145	59,497	3,547	57,917	3547	
2011-2014											

Source: Eunomix and UNCTAD report on trade misinvoicing.

As can be observed from the results in Table 1, it is unsurprising that the UNCTAD study has come under such critical scrutiny from mining and government sources in South Africa, both of whom have commercial and political interests in undermining the results of the UNCTAD study. The UNCATD data on gold exports from South Africa from 2000–2010 (see Table 1, column 7) is so low that on any reasonable reading it must be reflective of export recoding discrepancies or errors rather than any conceivable evidence of commercial malfeasance. For example, it is inconceivable that South Africa, amongst the world's largest producers of gold especially in this period, would be exporting a mere \$5.8m (in 2014 dollars) in 2001 when production was approximately 400 tonnes. Yet the authors of the original UNCTAD report took an obviously unquestioning approach to such glaring statistical discrepancies and argued that 90% of the difference between \$5.8m and \$3,915m in 2001 constituted a realistic estimate of IFF in the gold mining industry in that year. Initially, the UNCTAD accepted the Comtrade data irrespective of such obvious inconsistencies and weaknesses. This is once again not to suggest that trade malpractices do not occur in gold mining, but rather that the evidence presented by UNCTAD is of insufficient quality to come to the sorts of their very strong conclusions.

However, post-2010 is where the Comtrade and SA data are more consistent, yet the data still shows significant discrepancies between comparisons of South African data and the mirror/ trade partner's data, and not necessarily from flaws in the Comtrade data. This discrepancy warrants further forensic analysis, which would require parliamentary intervention.

The data source of the UNCTAD study has been criticized with various alternatives suggested by South African Chamber of Mines, Stats SA, and the South African Reserve Bank. One major issue that cannot be ignored is the reliability of this industry data. South Africa, unlike Tanzania for example, has no system of volume and assay verification, and estimates provided by the mining companies are simply accepted. This should be an issue of policy concern, as without accurate value and volume data one cannot ensure that royalties and taxes paid to the government are appropriate. The verification of the amounts of minerals being exported is an issue of contention even though the process should bring about transparency and accountability. The result is often more distrust as has more recently been highlighted by the Acacia dispute in Tanzania (Forstater & Readhead, 2017).

The residual and trade misinvoicing methods devised by Bhagwati and used by UNCTAD only capture illicit transfer of funds through custom re-invoicing, and does not capture mispricing on the same customs invoice (Njie, 2015; Kar & Cartwright-Smith, 2010); nor do they address the other very common forms of transfer pricing that occurs in international trade and are discussed below. The huge estimates made by the UNCTAD and UNECA are believed not to reflect the actual IFF, while some authors suggested they could be higher (Njie, 2015) as the methodologies only capture official customs recordings that may be evaded. However, it is also argued that if local data is used instead of using some of these practices, as was the case with Eunomix, the results would be more reflective of what is transpiring in the respective countries.

The literature on trade flows suggests that there are significant and understandable discrepancies in bilateral trade data, with some notable reasons being: differences in trade statistics reporting systems, country of origin versus country of destination estimates, free on board (FOB) and cost, insurance and freight (CIF) differences (UN Comtrade, 2016; Kar, 2009; UN, 2004; Ajayi, 1998). Moreover, Comtrade openly provides a significant caveat regarding the accuracy of its trade data (UN, 2016). All these, including leads and lags in trade, can constitute a perfectly straightforward explanation of a large part of a portion of the observed discrepancies in trade statistics between trading partners.

The work undertaken by Eunomix focused on issues surrounding the UNCTAD report, and was certainly not mandated by the mining companies to look at the wider issues involved in TPM. Transfer pricing is in some forms a legal activity, but in its more aggressive forms borders on tax evasion, which is a criminal activity in many jurisdictions. There are, however, many ways to transfer assets, income, and profits to low tax jurisdictions. Indeed, an entire international administrative infrastructure⁵ has emerged over the last fifteen years stemming from work of the OECD and the IGF around the issue of trade malpractice and IFF, with much of the work focused on the mining sector.

According to the IGF (2018), some of the methods of transfer price manipulation that are commonly employed in the mining industry include:

1. *Excessive Interest Deductions*: Companies may use related-party debt to shift profit away from mineral-producing countries via excessive interest payments to related entities (IGF & OECD, 2018).
2. *Transfer Mispricing*: Transfer mispricing is when related parties distort the price of a transaction to reduce their taxable income. In mining ventures this is commonly undertaken at the beginning of the project through engineering, procurement, construction and management (EPCM) firms when the mine is being developed (World Bank, 2017). This is one of the more difficult transfer pricing techniques to detect.
3. *Undervaluation of Mineral Exports*: This is a feature of transfer mispricing specific to mining: companies may sell mineral products to a related entity at prices below market rates, thereby moving sales revenue and profits offshore to take advantage of lower tax rates.
4. *Indirect Transfer of Mining Assets*: Sale of ownership of mine assets (or the companies themselves) can generate significant income, which many countries seek to tax as capital gains. However, indirect sales that take place offshore may be harder to tax, potentially resulting in hundreds of millions of tax dollars foregone (IMF, OECD, UN & WBG, 2017; Wentworth & Schatan, 2016).

⁵ The Intergovernmental Forum on Mining Minerals metals and Sustainable development (IGF) emerged from the 2002 World Summit on Sustainable Development in Johannesburg, South Africa where delegates recognized the challenges and opportunities related to mining and sustainable development. It is funded largely by Canada and its secretariat is housed within the International Institute for Sustainable development since 2015.

5. *Metals Streaming*: Metals streaming involves mining companies selling a certain percentage of production at a fixed cost to a financier in return for funds for mine development and construction.⁶ Companies may agree to lower sale prices for long periods of time, thereby reducing royalty and tax collection.
6. *Abusive Hedging Arrangements*: Hedging means locking in a future selling price to manage risks of price fluctuations. A problem arises when companies enter hedging contracts with related parties to set an artificially low sale price for production, reducing a mine's taxable income (Kabinga & Yambani, 2017; Nhekairo, 2014).⁷

The estimates made by the UNCTAD and UNECA only attempt to measure one form of IFF: under-invoicing of mineral exports. The greatest weakness of the approach, which stems from Bhagwati's work, is that it ignores the complex, sophisticated and multi-pronged approach that an optimal tax avoidance strategy involves. It is the greatest weakness of this approach: it substitutes rigour for headline-grabbing macro estimates that tend to do more harm than good to proper scientific research of this matter, which is so crucial to the development of African countries.

3.2 The Acacia-Tanzania Dispute

Recent disputes in the gold sector have not only focused on under-invoicing of exports—i.e., undervaluation of prices—but also the actual volumes that have been exported. In many African countries border management⁸ is so poor and recording of exports so weak that many, including the most sophisticated, have no idea what is being exported, and to exactly which destination.⁹

The most recent controversial disputes regarding the volume and value of trade has been that which occurred between Acacia and the Government of Tanzania (GoT). In early March 2017, the Tanzanian Ministry of Minerals issued a press release banning the export of gold-bearing concentrate; arguing that the concentrate should be exported in a more processed form (Morcombe, 2017).¹⁰ In late March 2017 the President of Tanzania, Mr. Magufuli, paid a very public visit to the port of Dar es Salam to inspect some 277 containers of concentrate that were held there pending approval of authorities (Kamagi, 2017). Thereafter, two presidential committees were established to ascertain the actual volumes of minerals being exported. In May 2017, the first committee concluded that the

⁶ This is one of the ways Japan was able to obtain cheap copper for processing in the 1970s.

⁷ Zambia has excluded all hedging losses from the calculation of income.

⁸ Before going any further, it is worth noting that there is a distinction between contraband and smuggling operations by crime syndicates involved in illegal and informal mining compared with the export procedural chain, determined and approved by governments and in the case of this study, the Government of Tanzania.

⁹ Namibia, for example, claims that its biggest export market is Switzerland and yet the Swiss mirror data says almost nothing is imported from Namibia. The main export item is copper. See Namibia Statistics Agency - Annual Trade Statistics Bulletin.

¹⁰ The basic argument that Acacia makes for the export of concentrate rather than gold dore is because the volumes of concentrate are insufficient to justify the construction of a concentrator.

shipment in the Port of Dar es Salaam contained levels of gold that were approximately eight times that of which Acacia had declared. An independent assessment undertaken by the Center for Global Development argues that:

The first committee reported that the concentrate contained around twice as much copper and silver, and eight times as much gold than was declared by the company (the main value of the concentrate comes from gold). They also detected a range of rare earths. According to their calculations, each container contains 28 kg of gold and is worth \$1.36 million while information published by Acacia suggests that each container contains 3.3 kg of gold, 2.8 tonnes of copper, and 2.6 kg of silver and is each worth around \$0.15 million. If the committees' findings are accurate, the extent of the undervaluation would be enormous, amounting to almost \$4bn annually (one-tenth of Tanzania's GDP).

The second committee scaled these figures up to cover 61,320 containers exported between 1998 and 2017, suggesting the true value of concentrate exports was \$83bn and that the government had lost \$31bn of revenue trade due to misinvoicing and transfer price manipulation. Acacia maintains that they have always declared all materials produced and paid all royalties and taxes that are due (Forstater & Readhead, 2017).

Acacia stated that it was not given a copy of the report (in part or summary), nor had it received the assay results upon which the conclusions were drawn (Acacia Mining Plc, 2018).¹¹ In response to the findings, Acacia issued a press release saying:

The (first) 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 9 mines (Acacia Mining plc, 2017).

The Tanzanian assertions were widely dismissed in mining circles (Van Wyngaardt, 2017); and even amongst those who were broadly sympathetic to Tanzania's position and the obvious need for reform of its mining tax regime (Forstater & Readhead, 2017). The failure of Tanzania to present the results of its own assay tests publicly, along with technical annexes; and to be completely transparent in any way or form, has only served to exacerbate investor perceptions of the country (ibid.).¹²

¹¹Acacia requested copies of the reports of the two Presidential Committees and called for independent verification of the results announced by the committees, but at the time of writing had not received a response to these requests.

¹²The only documents provided by the presidential committee was a written record of the speeches given by the respective Chairs of the first and the second presidential committees on the occasions of the presentation of the two reports (24 May and 12 June 2017) to President Magufuli, and presented in Swahili. The documents provide a summary of the conclusions of both reports. However, the reports themselves and details of the sampling protocol followed by the Committee on which these conclusions are based have not been made public—even to the mining companies—neither in Swahili nor in English. Sources: Link to the government page: <https://www.ikulu.go.tz/index.php/media/publications>. Downloaded link to the documents: https://ikulu.go.tz/files/publications/attachments/1_sw.pdf, https://www.ikulu.go.tz/files/publications/attachments/2_sw.pdf

However, these matters of what is commonly referred to as ‘resource nationalism’ are rarely unique as they initially appear. This dispute—which was conducted in such an opaque manner—has its origins in the unbalanced mining taxation regime imposed on Tanzania in the 1990s 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, had paid no company tax. The 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 (OpenOil, 2016; Acacia Mining plc, 2016). This experience is not unique to Tanzanian gold: the situation also pertains to Zambian copper, which is a result of poorly designed mining tax regimes of the 1990s ensuing in cycles of state-company disputes (Fraser & Larmer, 2010). These poorly designed laws, drafted as they were during the period of ‘high globalization’ (i.e., 1995–2005), resulted initially in what was intended: a substantial increase in minerals exploration and development; but in the longer term resulted in an unstable commercial environment that has harmed both investors and governments in Africa.

The miners responded to the obvious need to negotiate another agreement with Tanzania to resolve the dispute. To that end, Barrick Gold, the majority owner of Acacia, moved to begin negotiations with the GoT. In October 17, 2017, it announced that an agreement had been reached between them and the GoT in regards to a new partnership structure between the government and Acacia, with the new agreement seeing economic benefits being shared equally going forward (on a 50/50 basis).

By May 2018 there still had been no formal agreement between the parties to a revised taxation regime for the affected Acacia-owned mines in Tanzania (Businesslive, 2018).¹³ In late 2018, the concentrate that had been seized by the government was still being held in the Port of Dar es Salaam. However, the turn of the year (2019) saw the government of Tanzania remove the export ban on concentrates (Mckay, 2019). This, however, was in the midst of arbitration between the government of Tanzania and Barrick (Reuters, 2019). However, Barrick has recently reached an agreement with the GoT to settle all disputes concerning the mining companies formerly operated by Acacia Mining. The terms of the agreement include: “... *the payment of US\$ 300 million to settle all outstanding taxes and other disputes; the lifting of the concentrate export ban; the sharing of future economic benefits from the mines on a 50/50 basis; and the establishment of a unique, Africa-focused international dispute resolution framework*”.¹⁴

Following the Acacia dispute, the GoT has rewritten its mining laws in a spirit that replicates the political cycle that was seen in Zambia that saw the introduction of an

¹³In May 2018 the Government of Tanzania revoked a retention license held by Glencoe and Barrick Gold. The license for the Kabanga nickel project in north-western Tanzania, which was among 11 retention licenses cancelled by the government under the Mining (Mineral Rights) Regulations of 201.

¹⁴For more, see: <https://www.tanzaniainvest.com/mining/barrick-settle-dispute-with-about-acacia> and follow us on www.twitter.com/tanzaniainvest

additional profits tax in 2008, and its revocation the following year (Fraser & Larmer, 2010). Tanzania responded to what it correctly perceived as mining laws that had given rise to inequitable outcomes. Three laws have been passed that increase the government's control over the mining sector (Van Vuuren, 2018):

- The Natural Wealth and Resources (Permanent Sovereignty) Act, 2017
- The Natural Wealth and Resources (Review and Renegotiation of Unconscionable Terms) Act, 2017; and
- The Written Laws (Miscellaneous Amendments) Act, 2017 (Leon & Muller, 2017).

The Natural Wealth and Resources Act of 2017, otherwise known as the 'Permanent Sovereignty Act', requires that there be parliamentary approval for any future investor-state agreements. The legislation states that the agreements must secure the interests of Tanzanian citizens 'fully', and restricts investors from exporting raw minerals, repatriating funds, and accessing the international dispute resolution mechanism. The Natural Wealth and Resources Contracts Act of 2017, known as the 'Unconscionable Terms Act', mandates the GoT to renegotiate or remove terms from investor-state agreements that the parliament considers 'unconscionable'. The term 'unconscionable', is left ambiguous—even after efforts of an explanation (Leon & Muller, 2017). Finally, the Written Laws Act of 2017 ('Miscellaneous Amendments Act'), amends the Mining Act of 2010 by: (i) establishing a Mining Commission to regulate the industry; (ii) Overhauling the requirements for the storage, transportation, and beneficiation of raw minerals; and (iii) increasing royalty rates and government shareholding in mineral right holders, among other things. In effect, the changes in the law give the Tanzanian parliament authority that is widely expected to decrease foreign investment in the mining and related sectors (Leon & Muller, 2017; Ng'wanakilala, 2017).

3.2.1 The Under-Measurement of Gold Volumes and Quality

Most African jurisdictions accept the volume and purity estimates provided by mining companies when exporting doré or concentrate from their country without any attempts to verify the numbers, though in some cases there have been changes when it comes to the application of ad valorem export taxes (Office of the Prime Minister, 2016).¹⁵ South Africa, by far the continent's largest mineral exporter, does not undertake an independent assessment of the content of exports of minerals.¹⁶ In light of the fact that many also impose high ad valorem royalties, as well as export taxes (see Table 2), the failure to address actual volume of exports and production is of all the more concern as it undermines not only profit and net cash flow based tax liabilities, but also undermines royalty revenue. This is particularly problematic where, in the case of some commodities, taxes are specific in nature, and thus the only way to evade these taxes is through the underestimation of volumes rather than under-valuation of the underlying commodity. Table 2 sets out the gold royalty rates and export taxes in various gold producing jurisdictions in Africa.

¹⁵Namibia does however, require out turn results/assessment results.

¹⁶Perscom with Richard Rippon from the South African Reserve Bank on the 24th of August 2018.

Table 2: Gold Export and Royalty Rates in Selected African Countries

Country	Royalties	Export Tax
Botswana	5%	N/A
Burkina Faso	3%–5%**	3%
Cote d'Ivoire	3%–6%**	3%
DRC	2.5%	
Ghana	5%	
Guinea	5%	3% of the value of exports by natural persons, the Central Bank and other legal persons; and 5% of the value of exports by mining companies, except where an express provision of an agreement contains specific indications
Kenya	5%	
Madagascar	2%	
Mali	3%	3%
Mauritania	4%–6.5%**	
Namibia	3%	1%
Senegal	3%	3%
Sierra Leone	5%	5% (Individually mined gold is taxed at a lower rate of 3%)
South Africa	0.5%–5%*	N/A
Sudan	5%–7%	
Tanzania	4%	N/A
Zimbabwe	5%	

Source: Authors' revised table on royalties and export taxes from Deloitte (2015). Laporte et al. (2017), WTO Secretariat report on trade policy reviews; the Namibian Permanent Secretaries Public notice on tax alerts of export levies; Martin, A. & Helbig de Balzac, H. (2017). Furthermore, the study could not verify Export rates where there were blanks amongst recent credible sources.

NB: "*" indicates a progressive rate based on the profitability of the project. Whereas "***" indicates a variable rate based on gold price (Laporte et al., 2017). The Royalty rates are for the year 2015 except for Sudan which is dated 2017. Whereas, all the export rates except Guinea (2018) are for the year 2017. It should be noted in the case of Tanzania that the Tanzanian parliament passed a new law on which raises royalties from gold, among other minerals to six percent from four percent. See: <https://www.reuters.com/article/tanzania-lawmaking-mining/tanzania-raises-royalties-on-gold-and-uranium-exports-with-new-law-idUSL8N1JV4QD>. Furthermore, it should be noted that Tanzania does not impose an export tax, instead, the Tanzanian government has a clearing fee of one percent of the value of minerals that will be paid in clearing houses before export. See <https://www.nation.co.ke/business/Tanzania-introduces-new-mining-tax-in-budget-plan-for-2017/996-3962616-mqupn3z/index.html> and <https://www.tanzaniainvest.com/mining/1-percent-clearing-fee-mineral-export>. In the case of Zimbabwe, the royalty rate is on quantities above 0.5Kgs. See <http://www.mines.gov.zw/?q=mining-taxation-zimbabwe>.

In the case of Tanzania, we have seen the issues that arise when the government no longer has faith in the estimates made by mining companies, and loses confidence in its own national institutions that are legally mandated to monitor those exports. Leaving aside the legitimacy and technical justification for the actions taken by the GoT, the dispute highlights the failure of African countries to have a credible and independent review mechanism of the estimates provided by gold mining companies. Ironically, Tanzania had what was arguably Africa's most sophisticated and relatively well-funded institutional review mechanism of mineral exports on the continent. The Tanzanian government had the technical capacity in the form of the Tanzanian Mineral Audit Agency (TMAA), and yet the

Acacia dispute occurred despite the existence of a well-funded in-country technical review organization. The TMAA's mandate was to monitor the quality and quantity of minerals that mining companies produce and export, and also conduct financial audits. No similar mechanism exists among other SADC countries.¹⁷ However, even with the audits taking place, it is widely held that mining companies still 'evaded tax payments' through under-invoicing of mineral exports (Athumani, 2017). Following the dispute between Acacia and the GoT, the government decided to disestablish the TMAA in November 2017 (TCM, 2017).

The Acacia dispute and alleged corruption was at the heart of the dismissal of the head of the TMAA and the Mines minister, the dissolution of the agency's board, and the ultimate disestablishment of the agency (*The Citizen*, 2017; Mohammed, 2017; Mzamo, 2017). This incident should, however, not be used or seen as a reason to avoid the implementation of a competent authority, whether nationally or regionally, but highlights the need for an effective and properly functioning institution that stands above that of parochial or national interests, and reports in an open and transparent manner. In other countries, co-operation even between government ministries on estimates of export volumes is limited. For instance, in Zambia, requests by the Zambian Revenue Authority (ZRA) to the mines ministry for reviews of estimates of copper exports by one major company were not complied with (Readhead, 2017).

There remains a further issue of IFF and inaccurate volume and composition estimates that stem from the refining process, and not just from declared doré exports. Normally concerns regarding the accuracy of assay results are only relevant when concentrates mattes; and in the case of gold and silver, doré exports are involved. However, the complete secrecy of the only LBMA accredited refinery in Africa—the Rand Refinery in Germiston—undermines the understanding of, and faith in, the commodity trading system in Africa. Gold is normally exported from a country as doré, and then produced to an LBMA standard 400 toz 'good delivery' gold bar of 99.5%, which is then tradeable on the London OTC market.

The question of the refinery out-turn results and what is recorded as by-products or even co-products in the refining process is often unknown to governments. These are deemed to be commercially sensitive and not normally disclosed to government authorities. The Rand Refinery in Germiston is in effect a utility that operates to refine gold on behalf of its shareholders, who are amongst the largest gold producers on the continent.¹⁸ Assay results provided by mining companies and the out-turn results provided to the miner by the refinery do not always match, and as a result, mediation

¹⁷South Africa has long accepted the volume estimates provided by gold mining companies. The authors concluded this after consultation with Perscom with Richard Rippon from the South African Reserve Bank on the 24th of August 2018. However, South African imports and exports of precious metals are regulated by the South African Diamond & Precious Metals Regulator (SADPMR), and a valid export approval issued by them is required to export goods. The export requirements are contained in a SARS publication: 'Prohibited and Restricted Imports and Exports List' which can be obtained from the SARS website at www.sars.gov.za under the following link: <http://www.sars.gov.za/ClientSegments/Customs-Excise/Pages/Prohibited-and-Restricted-goods.aspx>.

¹⁸The shareholding in Rand Refinery is AngloGold Ashanti (42.41%), Sibanye (33.15%), DRGOLD (11.3%), Harmony Gold Mining Company (10.38%), and Gold Fields (2.78%).

is frequently needed with an impartial third-party analysis undertaken in such cases. It is also significant that in the case of the Rand Refinery, not only are outturn results a commercial secret: even volumes of imports and exports are now not in the public domain. This is of concern especially considering the refinery's failure to publish annual reports since 2013. In 2013 the Rand Refinery had difficulty in explaining the apparent 'loss' of 2.7 tonnes of gold (BullionStar, n.d.; Rand Refinery, 2012),¹⁹ and required a bridging loan of approximately US\$100m from its shareholders.

3.3 Trade and Smuggling of Gold from Africa to UAE

There are several cases of countries emerging over the last few years as smuggling hubs in the African gold market. This is attributed to the shortcomings, among others, in the ASGM sector though smuggling and trade with tax havens like the UAE/Dubai, which also occurs from some large-scale mines. We saw in section one that even a relatively developed country like South Africa, which was once the world's largest gold producer, does not have one consistent database on gold production and exports. When gold production and trade in the rest of the continent is considered, the situation deteriorates markedly along with the accuracy of data. Table 3 sets out the estimates of gold production by country from three different source: (i) GFMS survey, which is widely considered as the most reputable source, but the one weakest in terms of the ASGM sector; (ii) reported imports of the UAE of gold from African countries; and (iii) the World Bank mining database. In the case of the UAE data, this is largely—but not exclusively—gold from ASGM sources, though as we shall see below Libya's massive exports of gold to the UAE are easily explained from just mined sources.

One case of the emergence of a smuggling hub is that of Mali, in which a recent study claims its export tax laws have turned the country into a conduit for the export of West African gold to the UAE (Martin & Helbig de Balzac, 2017; Frost, 2017). ASGM is largely an informal sector, partly due to its lack of recognition in comparison to hard rock mining. However, ASGM provides substantial employment (amount over return for certain parties involved). Nevertheless, 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*" (Martin & Helbig de Balzac, 2017). Even with some form of harmonization between Mali, Côte d'Ivoire, and Burkina Faso of a 3% export tax on gold, Mali's export policy of applying a tax to only the first 50kg of gold exported per month, among other issues, has 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.

¹⁹In 2013 Rand Refinery was delayed in the publication of its accounts because in the shift to electronic measures the company had. "Rand Refinery experienced implementation difficulties which led to a difference between the actual inventory and the accounting records of approximately 87,000 ounces of gold. Uncertainty around the true position has prevented the Company from being able to finalise its annual financial statements for the financial year ended 30 September 2013". See BullionStar. (n.d). Rand Refinery. Retrieved from: <https://www.bullionstar.com/gold-university/rand-refinery#en-2376-13>. The failure of the Rand Refinery to publish annual reports of its finance since 2013 has led to increased opacity and uncertainty regarding South African gold trade statistics.

Table 3: 2016 African Gold Production and Exports (MTPA)

GFMS - Gold Mine Production in Africa		Comtrade - UAE Import of Gold from Africa		World Bank - Gold production by country		
South Africa	145.7	Libya	81.517	South Africa	63.212	3.12
Ghana	94.1	Sudan	62.580	Ghana	61.68	7
DRC	60.4	Ghana	54.577	Burkina Faso	21.82	14.5
Mali	49.8	Mali	41.069	Mali	20.111	4
Tanzania	49.7	Guinea	31.194	Mauritania	18.56	
Burkina Faso	40.9	Egypt	30.243	Tanzania	15.688	
Zimbabwe	21.8	Tanzania	26.270	Guinea	14.92	1.2
Ivory Coast	22.6	Nigeria	21.208	Cote D'Ivoire	7.74	
Guinea	19.6	Togo	12.000	DRC Congo	7.31	
Egypt	17.1	Uganda	9.994	Egypt	5	
Sudan	15.5	Benin	9.990	Zimbabwe	3.33	
Ethiopia	12.0	Cameroon	9.939	Senegal	2.82	2.5
Mauritania	7.6	South Africa	7.218	Ethiopia	1.5	2
Namibia	7.6	Senegal	5.394	Namibia	1.4	
Senegal	6.8	Rwanda	4.882	Botswana	1.08	
Zambia	4.6	Chad	4.668	Morocco	0.72	
Other	18.9	Niger	4.337	Liberia		4.93
Total Africa	594.9	Madagascar	4.056	Eritrea		4
		Liberia	3.310	Total	246.891*	43.25**
		Burundi	2.841			
		Mozambique	2.748			
		Eritrea	2.680			
		Ethiopia	2.640			
		Malawi	2.355			
		Somalia	1.687			
		Republic of Congo	1.378			
		Zimbabwe	1.323			
		Kenya	1.013			
		Dem. Rep. Congo	.620			
		Others	2.409			
		Total	446.140			

Notes: *This total is of what is categorized as producing mines output; ** This total is of what is categorized as the output of mines at an advanced study stage

Sources: **GFMS data:** GFMS Thomson Reuters (2018). **Comtrade data:** Comtrade statistical database. **World Bank:** World Bank (2017).

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 whereas in 2014 Mali declared total production of 45.8 tonnes, the UAE imported 59.9 tonnes from Mali (Martin & Helbig de Balzac, 2017; Frost, 2017). 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) in 2016 (Martin & Helbig de Balzac, 2017).

Smuggling is not confined to the above cases only, but it is also prevalent across several countries and regions across the continent, as well as globally (Blore, 2015; Martin & Taylor, 2014). The prevalence of gold smuggling in and from countries such as Mali, DRC and Sudan should be of concern to all contiguous African countries.

They indicate that a network of illegal gold trading is occurring across the continent from conflict areas and fragile states experiencing political instability. These gold flows are often associated with money laundering, human trafficking, and other illicit activities (Chamberlain, 2018). Part of the driving force for smuggling stems from the difference in export tax rates that should be harmonized as clearly all African countries would benefit from an improved and harmonized system of trade recording.

The following brief analysis is based on Comtrade data for the UAE imports of unwrought gold, i.e., HS7108.12. This is the same data source that has come in for such criticism in the first part of this article. The data is based on imports into the UAE of gold from Africa, and is based on regional import data.²⁰ There are numerous reasons that the analysis below should be tempered with considerable scepticism considering what has been discussed above. First, a very large part of the gold imports into the UAE is doré, and hence the volumes of imports are subject to the assumption that the volumes being declared at the UAE border and assayed by exporters are in fact correct.²¹ In some cases these volumes may be incorrectly entered by customs officials. Second, the dollar value of imports that are declared might be undervalued by importers, though there is little financial incentive as there are no taxes on gold in the UAE.

Given these data limitations, can one draw firm conclusions from unit import values of gold entering the UAE? Clearly, prudence is required but there are some reasons why this data may be somewhat more accurate than that used in the South African case. First, the data comes from one jurisdictional source only, the UAE; and second, there is no obvious tax or financial incentive for gold importers or exporters to present inaccurate data on imports to the UAE as is the case of high tax jurisdictions (Global Witness, 2014). Second, the data presents a remarkably consistent picture of African countries selling gold in substantial volumes, and sometimes in volumes far in excess of known production; and at unit import values well below the average price in 2016, which is the year used for the purpose of analysis.²² It also presents a picture of unit import values, in many cases being well below the minimum gold price of that year. Not one country in Africa sold gold to the UAE in 2016 at unit import values that were above the average world gold price. This outcome is shown in Figure 1. This difference may be explained by the fact that when selling doré, there is normally a 1-3% refining and marketing charge, which is normally less than 1% for bars. However, the unit import value is below the average price for 2016, and may simply be a result of unfortunate timing of sales; but the outcomes are remarkably similar for all countries, even for countries like Libya, which was Africa's biggest exporter of gold in 2016 at 81

²⁰The UAE comprises of Abu Dhabi, Dubai, Sharjah, Ajman, Umm Al-Quwain, and Fujairah, while the seventh emirate, Ras Al Khaimah, joined the federation in 1972. Dubai has by far the largest gold market, but all other countries in the UAE are also importers of gold.

²¹At an international level, the HS classification for unwrought gold does not differentiate between doré and bullion which are classified at HS 7108.12 at six-digit level. Some countries like the USA, for example, have created 10-digit HS classifications such as Gold ore which is HS 7108.12.1010 and HS 7108.12.1020 which is bullion.

²²The data for 2012-2015 shows a similar pattern.

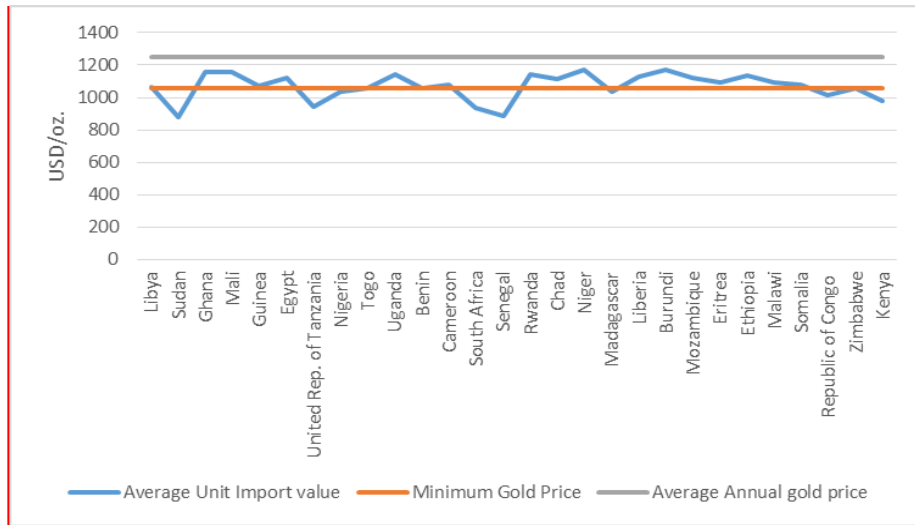


Figure 1: Comparison of Gold Unit Import Values for 2016 - Top 26 African Exporters to the UAE

Source: Authors' compilation.

tonnes, followed by Sudan at 62 tonnes, which by early 2018 had expanded production to such an extent that it rivalled both Ghana and South Africa as the continent's largest gold producer. Moreover, Sudan which is one of the largest African gold producers and trader with the UAE, sold gold at a unit import value of \$881/oz in 2016. This is the lowest unit import value of any exporter from Africa to the UAE.

Libya and Sudan are the two most significant cases of gold trading and smuggling to the UAE. Libya was not known to produce such amounts of gold, and has no operating large-scale mines, yet the UAE recorded some 81 tonnes of imports from Libya in 2016. In 2011, when the Libyan civil war began, Libya sold some 27 tonnes of official reserves (World Gold Council, 2018). Since then estimates of the country's official reserves have remained constant. But since that time, it has sold or exported a total of some 200 tonnes of gold, which made the country Africa's largest exporter to the UAE. The origins of the gold that has been exported from Libya to UAE is unknown, and could have been—at least in part—smuggled from sub-Saharan Africa, including from neighbouring Sudan. This could also be funds used to pay for the very substantial human trafficking occurring through Libya; or more probably it is part of the much discussed 140-tonne gold stock held by the former Libyan dictator Muamar Gadhafi (WikiLeaks, 2011); and disposed of into the UAE markets either by various 'governments' in Libya, or by the various warlords that have controlled different parts of Libya since the death of Ghaddafi. Whether the gold comes from these sources or is smuggled across the Sahara from the many gold-producing countries such as Sudan that border or are in proximity with Libya,

is also unknown. While the costs of refining may explain the significant difference between the world price and unit import value for producing countries like Sudan, which exports doré, it is unlikely to explain Libyan gold that is far more likely to be already refined gold; and should have been traded close to the world spot price. A further explanation of the gold sales into the UAE may also be explained, in part, by the sales by private Libyan citizens during the years of conflict starting in 2011.

4. Conclusions and Policy Implications

The last few years have seen a proliferation of allegations regarding IFF, gold theft as in the case of Tanzania, and gold smuggling from West Africa, the Great Lakes region, Sudan and Libya. IFF almost certainly occurs in the gold mining sector in Africa, but the use of the Bhagwati technique of estimation, when using what is often unreliable Comtrade data, gives an inaccurate and over-estimated value of only one form of IFF. By focusing on only one method of transfer pricing, the under-invoicing of exports, UNCTAD and UNECA have done the debate on IFF in Africa a disservice. If there are one or two rules of this sort of commercial behaviour (transfer pricing and/or under-invoicing) it is that one should use the technique least susceptible to detection by authorities, i.e., where there is no easily discernible arms-length price; and second, one should never overuse only one method and rely on a variety of IFF techniques that are discussed above to erode local company tax bases. The initial UNCTAD study estimated the value of gold undervaluation from South Africa at \$78.2bn from 2000–2014. This was simply based on erroneous data and poor analysis, and was subsequently revised downwards. The problem with the technique is that it assumes that companies use one method of transfer pricing, whereas there are various methods that are commonly used. The only scientifically valid method for analysing transfer pricing is through forensic audits. One such publicly available audit was undertaken by the ZRA of the Mopane copper mine, owned principally by Glencore in 2010 (Grant Thornton & Econ, 2010). These forensic audit reports rarely appear in the public domain, and are both expensive and time consuming, unlike the Bhagwati method. It is this that explains the revealed preference of economists for the continuing use of the Bhagwati method despite its obvious shortcomings.

The conflict between Acacia Gold and the GoT was principally about alleged gold theft. Acacia was accused by the government of under-declaring gold and other mineral content of the concentrate that was being loaded at the Dar es Salaam port for refining abroad. The order of magnitude of the difference between what Acacia declared and what Tanzania claimed was in the ore was of such magnitude that the accusation was tantamount to theft. However, at no point has Tanzania released its assay results, nor the protocols used as a justification for its accusations. It is this failure to disclose that has brought Tanzania into disrepute, and the accusations have been widely dismissed in mining circles. While the accusations may have no transparent scientific basis, the foundation of the dispute lies, as in similar investor-state mining disputes in neighbouring Zambia, with mining laws drafted in the 1990s by the World Bank, which were overly generous to mining investors, and gave very little tax benefit to the state. African states have, as a group, generally accepted the volume and assay estimates of the LSM.

Many have no capacity to do so, and establishing such a capacity inside Africa's regional economic communities may well be a method of addressing this failure of mining policy.

The last issue that this study has addressed is the widespread trading/smuggling of gold from Africa to the UAE. There is an increasing evidence that gold is being sold into the Dubai market at unit import values that are well below world averages. Moreover, gold is being exported to the UAE in volumes and by countries that are not known to mine gold, least of all in such volumes, such as Libya, Africa's largest exporter to the UAE in 2016. There are other countries that export in volumes far in excess of domestic production such as Uganda, Rwanda and Burundi in the Great Lakes region; as well as exporting in significant volumes by countries such as Nigeria, Mali, and Benin. Many of these countries are evolving as gold smuggling hubs, and further analysis of the trade is required. The total volume of gold exported from Africa in 2016, as reported by the UAE authorities, was 448 tonnes, half of UAE purchases. In the case of Sudan—Africa's third largest gold producer—gold was being imported into the UAE in 2016 at a 31% discount of the gold price. Furthermore, the country is by far the largest source of supply to the UAE from Africa that sells its gold to the UAE at the lowest unit import value of any country in Africa.

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