

Illegal Trade in Gold from  
Peru and Colombia  
Understanding the  
Dynamics, Routes, and U.S. Linkages

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## About TraCCC

The Terrorism, Transnational Crime and Corruption Center (TraCCC) is the first center in the United States devoted to understanding the links among terrorism, transnational crime and corruption, and to teach, research, train and help formulate policy on these critical issues. TraCCC is a research center within the Schar School of Policy and Government at George Mason University. TraCCC also houses the innovative and highly-respected [Anti-Illicit Trade Institute \(AITI\)](#).

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# Illegal Trade in Gold from Peru and Colombia. Understanding the Dynamics, Routes, and U.S. Linkages

Camilo Pardo-Herrera, PhD

## Executive Summary

The environment is under increasing pressure from global economic dynamics and the constantly increasing demand for raw materials. In this context, environmental crimes in general and illegal mining in particular, play a key role as they disregard any consideration for sustainable resource extraction. In the Amazon region, one of the most vital ecosystems around the world, illegal gold mining has been identified as the most critical threat to the sustainability of the life of its ecosystems.

There is evidence of large quantities of illegal mining production both in Colombia (two thirds of all production) and Peru (25 to 30 percent of all production). However, since gold is extremely valuable, portable, it stores value—even under extreme market conditions—, it can be reshaped in any way thinkable, and is not intrinsically illegal, introducing illicitly extracted gold into official supply chains is fairly easy. Once introduced, it flows freely through national, regional and global markets, and its proceeds do so through the international financial system. It is estimated that illegal mining accounts for up to USD 48 billion a year in criminal proceeds.<sup>1</sup>

In this context, organized crime associated to the illegal extraction of gold in the Amazon continues to grow in number, size and scope in response to the insatiable global demand, and thanks to the possibility to launder and reinvest their proceeds through illicit financial flows.

Thus, an efficient response to the challenges posed by illegal gold mining should be comprehensive and include not just efforts to curb illegal mining, but also, and more importantly, efforts to address the illegal flows of money taking place through the gold trade.

Although it only analyzes a small sample of the entire global gold market, this paper provides substantive evidence of the illegal flows of money through the gold trade from Peru and Colombia into the United States. While this report is in no position to assert the commission of crimes—since it is only analyzing data—it presents enough evidence to identify points of entry for further criminal investigations and potential judicial action.

There is evidence of companies smuggling gold from Venezuela into Colombia, which is then exported into the United States. Between 2010 and 2021, a total of 68,2 tons of gold worth a total of 2.6 billion US dollars, were apparently smuggled through the border in vicinities of Cucuta. Three companies, one in Colombia (CIJ Gutierrez) and two in the United States (Asahi Refining USA Inc., and Johnson Matthey Inc.) concentrate over 90 percent of this trade. Gold trade through this route stopped after 2018 when an Executive Order was signed targeting all parties involved in the trade of Venezuelan gold.

There is also evidence of gold and mercury smuggling along the border between Peru and Bolivia and illegal gold production shifting geographies after policy decisions are made. Data show an inexplicable spike in Bolivian gold export in 2014—with no increases in production—which coincides both, with

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<sup>1</sup> INTERPOL (2022) Illegal Mining and Associated Crimes. A Law Enforcement Perspective on One of the Most Lucrative Crimes, at: <https://www.interpol.int/en/News-and-Events/News/2022/The-devastating-impact-of-illegal-gold-mining-in-Latin-America>

a ban on mercury by Peru, and a decrease in Peruvian production and exports. This suggests the shifting of illegal mining from Peru into Bolivia, and also of gold smuggling in the same direction.

There are clear indications of mis-invoicing of gold trade between these three countries. Peruvian data show significantly higher weight values than those reported at US destinations between 2016 and 2018. A very similar pattern can be seen in Peruvian total exports to the world. Concurrently, trade data show that 29 percent of all shipments from Peru to the US were priced at 70 percent or less the actual international price during that same time. Although available data does not permit to assert whether it is a case of overstating the weight of the gold or undervaluing its value, the temporal coincidence of weight and value discrepancies allows to suggest a general case of mis-invoicing during this time.

Colombian data also suggests potential cases of mis-invoicing. Between 2015 and 2016, US statistics reported weight about 50% above those reported by Colombian customs. Price data show that in nine percent of the shipments —approximately 16 tons— gold was paid at 70 percent or less of the global gold price at the time of the transaction. Only a handful of businesses at both sides of the transactions explain most of this trade and are identified — 85 percent of the undervalued shipments is executed by five Colombian firms, and six businesses at the US side concentrate 86 percent of undervalued purchases. Trade in overpriced gold is also identified.

Data analysis suggests irregular patterns in the rate between net and gross weights, which could respond to fraudulent reporting and concurrent illicit flows of value. For example, while most shipments use 0.2 grams (or less) of packaging per every gram of gold sent, an important percentage report using three and up to five times that weight. Of these irregular shipments, over 90 percent were sent by one company in Colombia —Metales Procesados Industriales— to two businesses in the US —Atomic Gold Inc., and United Precious Metal Refining Inc.

The analysis also raises warnings as to how certain reports are made. This is the case of volume of shipments reported by Colombian customs, which is not the result of a measurement, but of an estimation using the net weight of the shipment. This is, instead of measuring the volume of each shipment, this field is populated using the density of gold, which is a constant, derived from the net weight of the shipment. Although not the result of fraud, but a standard procedure, this hinders transparency and the possibility to monitor the trade between Colombia and the US.

There is evidence of a trend to create shell companies to engage in the trade in gold; presumably of illegal gold. Peruvian tax data shows large numbers of companies participating in the trade in a very sporadic fashion, which contradicts stable and long-lasting trade relationships usual in the international gold market. These companies have a very short legal life, and concentrate all of their commercial activity within a few months, only to cease to exist shortly after. Between 2016 and 2021, these companies traded gold for a total of 230 million USD.

## **Introduction**

The environment provides the very foundation of life on earth, both human and non-human. All species on the earth rely on nature for water, air and food. Natural resources also provide livelihoods, and the raw materials used to uphold economic production, which in turn produces jobs and revenues for governments to manage and invest on education, health care, and other public goods. The environment is globally recognized as the basis for human co-existence with other forms of life on Earth in a long-term perspective, as agreed on the seventeen sustainable development goals adopted in 2015.

However, the environment as the very essence of sustainability, is currently under increasing pressure from global economic dynamics and the ensuing ever-growing demand for goods around the world. In this context, environmental crime — activities harming the environment benefiting private interests from the illegal exploitation of, damage to, trade or theft of natural resources — plays a key role in environmental degradation, as it disregards any consideration for sustainable resource extraction. In turn, financial crimes allow environmental criminals to launder their dirty money and reinvest in their illegitimate businesses, producing a more severe threat to human security every time.

The Latin America and the Caribbean (LAC) region is key in the global response to environmental degradation as a consequence of illicit economies. LAC is one of the richest environments in terms of biodiversity and therefore fundamental for the sustainability of the planet. Alone, it holds 40% of the world's biological diversity, it hosts 11 of the 14 terrestrial biomes, about half of global forests, and the second largest reef system in the world.<sup>2</sup> It is then no surprise that the continent has been the site of extensive raw material extraction ever since its colonization by Europeans in the late 15th century. Today, environmental crimes in general, and illegal gold mining with all of its associated crimes in particular, pose one of the major challenges to the biodiversity of the region and in turn, to the sustainability of the global community.

The fact that these illegal economies continue to grow exponentially every year is explained not only by the growing global demand that triggers the illegal supply, the corruption that enables them, or the lack of institutional capacity in source countries. Their continuous expansion in size and scope is also explained — and to a large extent— by the possibilities that the international trade system provides to illicitly move value across borders, and those that the international financial system provides to hide the dirty money. Illicit financial flows (IFF), the illegal movement of money or value across international borders, are a means through which environmental criminal launder the proceeds of their illegal activities, evade taxes, capital flight regulations, or stash their cash through shell companies in tax heavens to avoid the reach of the state.

This document focuses on the study of illicit financial flows in the trade in gold out of Peru and Colombia, into the United States. It analyzes bilateral trade statistics (2010-2021) between these countries, in order to contribute to a better understanding of the illegal trade in gold as well as cross-border illicit pathways. Based on that, it develops a set of methodologies through which to produce targeting information to help the Department of Homeland Security (DHS) disrupt the illegal activity across borders, and identify linkages to the U.S. market. The document aims to bring attention to the downstream portion of the international supply chain (i.e. from export to final consumption) which is often overlooked, but has unquestionable impacts on the persistence and expansion of illicit activities.

With those objectives in mind, the document is structured in five sections following the logic of the international supply chain. The first provides an introductory description of the global gold supply chain (from production to export). A second section presents estimates of illegal gold production in each country, as described in existing literature, followed by a description of the main methods used to launder (or formalize) illegally extracted gold in the countries under study. Section four details the main findings of the study, this is, a set of methodologies to produce red flags that point in the

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<sup>2</sup> OECD (2018), Biodiversity Conservation and Sustainable Use in Latin America: Evidence from Environmental Performance Reviews, OECD Environmental Performance Reviews, OECD Publishing, Paris.  
<https://doi.org/10.1787/9789264309630-en>

direction of potential illegal activities performed in the international trade in gold from Colombia and Peru into the United States. The document ends with a section on policy recommendations.

*i. Description of Supply chain*

The global supply chain of gold follows a basic extractive pattern. This is, the mineral is largely produced in its raw form in the global South and exported to manufacturing hubs around the globe, which subsequently commercialize it back to producers and the world in its manufactured forms. In 2021, for example, 60% of the 3.5 tons of gold produced globally came from Latin America, Asia or Africa, and most of it went to Europe, which contributes very marginally to the world's gold production—not even reaching one percent—but buys approximately half of the world's yearly supply (44.8%).<sup>3</sup> Adding other non-producing countries to the calculation, such as the United Arab Emirates, or India, this percentage can reach about two thirds of the world's total production.

About 20% of the gold that is produced every year globally is dug out by artisanal or small-scale miners (ASM). The remaining 80% is produced by medium and large-scale mining companies that employ heavy machinery, sophisticated technology, and environmentally conscious processes. However, although ASM produce a smaller portion of the global output, it is estimated that about 40.5 million people around the world work in ASM and that approximately 150 million depend on it, in contrast to the 7 million who derive their income from medium and large-scale mining around the world.<sup>4</sup>

The last few decades have seen an expansion of the global demand for gold never seen in history. The consequent rise in prices is very telling of the progress of the dynamics of this demand, which currently could easily be defined as inelastic—no matter the price, buyers will keep buying (fig.1). In this sellers' market, buyers who refine the gold look for supply sources of the raw material all around the world and when stable producers are found, stable commercial relationships emerge and are kept for as long as possible. This is clearly seen in statistics that show “trade couples” who engage in trade for extensive periods of time.

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<sup>3</sup> World Gold Council. <https://www.gold.org/goldhub/data/gold-production-by-country>

<sup>4</sup> IGF & IISD (2018). Global Trends in Artisanal and Small-Scale Mining (ASM): A review of key numbers and issues. Available at: <https://www.iisd.org/system/files/publications/igf-asm-global-trends.pdf>



Fig. 1

Regardless of the scale in which it is produced, gold follows generally the same path from its initial production, to the final use by customers, and in some cases, a subsequent recycling process. Literature categorizes the global supply in two parts — up and downstream— which in turn are organized in eight different stages as seen in the figure below (Fig. 2).

The upstream stage of the supply chain begins with the exploration and extraction phases, which according to the size of the project and the type of machinery and processes used, is defined as artisanal, small, medium, and large-scale mining. Usually artisanal mining, being a cultural tradition and a source of income for many indigenous communities around the world, does not require a license. Government involvement and regulation is often linked to the use of heavier machinery than the rudimentary tools used in artisanal mining processes. After the gold is extracted, especially in the case of ASM, a set of intermediaries buy it from a large number of miners to aggregate it into sizeable quantities to then be sold to exporters, who sometimes are also in the business of smelting the product before the final international shipping.



Fig. 2<sup>5</sup>

<sup>5</sup> Extracted from: Kickler & Franken (2017). Sustainability Schemes for Mineral Resources: A Comparative Overview. Federal Institute for Geosciences and Natural Resources. Available at: [https://www.bgr.bund.de/EN/Themen/Min\\_rohstoffe/Downloads/Sustainability\\_Schemes\\_for\\_Mineral\\_Resources.pdf?\\_\\_blob=publicationFile&v=6](https://www.bgr.bund.de/EN/Themen/Min_rohstoffe/Downloads/Sustainability_Schemes_for_Mineral_Resources.pdf?__blob=publicationFile&v=6)

As said, most of this gold is sent to the metal refining capitals of the world, where Switzerland has traditionally stood out with four of the five largest refineries in the world.<sup>6</sup> In recent years, the United Arab Emirates, Dubai in particular, has become also a major gold refiner and trading hub. Germany, Japan, India, and South Africa have also important global participation in this link of the supply chain.

The downstream portion of the global supply chain takes the gold from refineries around the world to manufacturing centers and then to trading businesses that reach the final customer either through retail or wholesale, depending on the sector. The jewelry business is the largest source of annual demand for gold around the world. Although slightly declining in the last decade, the jewelry sector still represents over 50% of the total demand for gold around the world every year.

The second most important sector demanding gold is investment. In 2021, about 25% of all gold in the world went to protect and enhance the performance of investment portfolios, as a means to reduce volatility and minimize risks. It is often argued—and given international prices during the last decades, it could be thought as confirmed—that investing in gold protects, and even improves, purchasing power of stakeholders in the short run. Other sectors that significantly contribute to the global demand of gold are technology, as the metal is ubiquitous in most consumer electronics and automotive applications, and Central Banks, which are again significant holders of gold, a trend that had gone in disuse, but was reinstated after the financial crisis of 2008.<sup>7</sup>

Finally, and since the global demand is not completely satisfied by the gold that is mined every year around the world, some of the gold used for jewelry goes through a process of recycling. A stage that then restarts the downstream supply chain towards final users.

ii. *Estimates of Illegal gold production in Peru and Colombia*<sup>8</sup>

Establishing an accurate estimate of the illegal production of gold in Peru and Colombia is problematic. This is mainly due to the lack of an agreed definition of illegal mining, which tends to overlap with other forms of exploitation, such as artisanal, subsistence, informal, or projects in the process of being regularized.<sup>9</sup> Also, when legal definitions have been reached, given the myriad of extraction processes, it is difficult to draw lines and apply legal labels to each case. As a result of this conceptual complexity, small and artisanal miners are sometimes treated as criminals, and at the same time illegal miners can pose as small or artisanal, to avoid legal consequences of their activities. Tied to this, is the fact that artisanal mining does not require a license and can therefore be executed anywhere, a condition that is often abused by illegal miners in order to continue their extraction under the disguise of informality.

Still, what most observers agree on, is the fact that regardless of how it is defined and measured, illegal mining has grown significantly—at the same rates of legal extraction—over the last decades, as a response to international demand. Historical and expensive official efforts to address unregulated

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<sup>6</sup> Shawn Blore & Marcena Hunter (2020) Dubai's Problematic Gold Trade. Available at:

<https://carnegieendowment.org/2020/07/07/dubai-s-problematic-gold-trade-pub-82184>

<sup>7</sup> Historical demand and supply (2022) <https://www.gold.org/goldhub/data/gold-demand-by-country>

<sup>8</sup> Although the focus of this research is not on the upstream supply chain, this section provides an idea of the extent of illegal gold that flows through the international trade system.

<sup>9</sup> The estimates of illegal gold production shown here, correspond to gold that is extracted from areas where no exploitation license has been approved.

extraction of minerals and the formalization of artisanal miners have been dwarfed by the influence of the international gold market.<sup>10</sup> This increase in illegal mining is tied to increases in other forms of environmental crimes such as deforestation and wildlife trafficking; in human rights violations, especially child and forced labor; and the financing of terrorist organizations and other forms of organized crime such as human trafficking.

Nonetheless, given the recent policies put in place to formalize artisanal miners and the existing mining registries in both countries, it is possible to suggest estimates of potentially illegal gold production. For example, in Peru, the Special Registry for Gold Traders and Processors (RECPO), which keeps data on all legal and natural persons dedicated to the trade and/or refining of gold, as well as their location, providers and the destination of the mineral produced, had over 4,800 registries in 2021. In the same sense, the Peruvian Registry for Mining Formalization (REINFO) had information on 24,000 miners in the process of formalization, 85% of which are located in the regions of Ayacucho, Madre de Dios, Arequipa, La Libertad, and Puno.<sup>11</sup> Putting these two sources of information together, it can thus be inferred that mining operations that are not accounted for by the RECPO or REINFO, this is, formal operations or in the process of being formalized, are illegal. Using this calculation, the head of the Peruvian Society of Mining, Oil and Energy (SNMPE) estimated that anywhere between 25 and 30% of the gold produced in Peru has informal or illegal origins.<sup>12</sup> In 2020 Peru produced close to 85 tons of gold, so this would mean that anywhere from 21 to 28 tons worth between \$1.1 and \$1.5 billion dollars.

In Colombia, using a similar approach but different technologies, the Mining and Energy Ministry and the United Nations Office on Drugs and Crime conduct a yearly study that provides evidence and contribute to a better understanding of the gold mining sector, its intricacies and the interphase between large-scale and artisanal and small-scale gold mining. The latest report, published in 2022, has the most recent and accurate information on illegal gold production in the country.<sup>13</sup>

Using remote sensing technologies (e.g., satellite imagery), geo-referenced information, and field work, the study identified sites of alluvial gold mining —the most popular in the country— and overlaps GIS layers of licenses (existing and in process) and environmentally protected areas, which by definition should not host mining operations. The results show that about two thirds of the alluvial mining projects are either not under any type of license or permit and are therefore illegal. As in the case of Peru, most of these enterprises are concentrated in a few regions (Antioquia, Chocó, Valle del

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<sup>10</sup> See *inter alia*, INTERPOL (2022) *Illegal Mining and Associated Crimes. A Law Enforcement Perspective on One of the Most Lucrative Crimes*, at: <https://www.interpol.int/en/News-and-Events/News/2022/The-devastating-impact-of-illegal-gold-mining-in-Latin-America>; LIVIA WAGNER (2021) *The Ecosystem of Illegal Gold Mining: Organized Crime Dynamics in the Artisanal and Small-Scale Gold Mining Sector in Peru*. At: [https://digitalcommons.fiu.edu/cgi/viewcontent.cgi?article=1042&context=jgi\\_research](https://digitalcommons.fiu.edu/cgi/viewcontent.cgi?article=1042&context=jgi_research); Global Initiative against Transnational Organized Crime (2016) *Organized Crime and Illegally Mined Gold in Latin America*, at: <https://globalinitiative.net/wp-content/uploads/2016/03/Organized-Crime-and-Illegally-Mined-Gold-in-Latin-America.pdf>; De Echave, José (2016) *La Minería Ilegal en Perú. Entre la informalidad y el delito* <https://nuso.org/articulo/la-mineria-ilegal-en-peru-entre-la-informalidad-y-el-delito/>; Nellemann, C. et.al (2016).

<sup>11</sup> REINFO's database can be accessed through the following link: [http://pad.minem.gob.pe/REINFO\\_WEB/Index.aspx](http://pad.minem.gob.pe/REINFO_WEB/Index.aspx)

<sup>12</sup> Raúl Castro, "SNMPE en CADE 2019: Los ingresos de la minería ilegal duplican a los del narcotráfico," *Gestión*, November 28, 2019, <https://gestion.pe/economia/cade-2019-mineria-ilegal-snmpe-en-cade-2019-los-ingresos-de-la-mineria-ilegal-duplican-a-los-del-narcotrafico-noticia/>

<sup>13</sup> *Explotación de oro de aluvión. Evidencias a partir de percepción remota (2020)*, available at: [https://www.unodc.org/documents/colombia/2022/Junio/Informe\\_Colombia\\_Explotacion\\_de\\_Oro\\_de\\_Aluvion\\_Evidencias\\_a\\_Partir\\_de\\_Percepcion\\_Remota\\_2021\\_SP\\_.pdf](https://www.unodc.org/documents/colombia/2022/Junio/Informe_Colombia_Explotacion_de_Oro_de_Aluvion_Evidencias_a_Partir_de_Percepcion_Remota_2021_SP_.pdf)

Cauca, and Guainía). Of these, half is being executed in protected areas, such as forest or indigenous reserves. In 2020 numbers this would amount to a total of 32 tons of gold, worth \$2.6 billion dollars.

Neither this study or the calculations made in Peru include considerations on artisanal or small-scale mining. This is so given the difficulty to track and measure a ubiquitous activity mainly executed by individuals who constantly enter and exit the business. So, how is so much gold introduced into the legal international market? The next section details some the ways through which illegally sourced gold is introduced into the formal supply chain once it is extracted from the ground.

### *iii. Gold Laundering*

Since gold is not intrinsically illegal, once it is extracted from the ground, it is fairly easy to introduce it into formal supply chains. Although this practice is widespread in ASM, for the reasons outlined above, medium and large-scale mining projects can and are also used to launder illegal gold.

The ubiquitous nature of ASM, along with the difficulty to apply legal definitions to the myriad forms of small-scale mining and the consequent conceptual overlapping between informal and illicit activity, make ASM especially attractive for gold laundering operations. In order to address this, producing countries are generally implementing programs for the formalization of artisanal miners. Colombia and Peru are no strangers to this policy approach. However, since ASM does not require a license and can therefore be performed anywhere, the period of time between extraction sites and the gold's first access to the formal process, at aggregator shops, is practically impossible. All of these factors are abused by illegal miners to introduce their gold into the established legal channels.

Mining registries will usually establish quotas for artisanal and small-scale miners.<sup>14</sup> So, the most common way to launder gold through ASM operations is by fraudulently creating registries for artisanal miners and use the quotas allowed by legislation to introduced illegally sourced gold into the system. Other similar forms are to pay registered miners to use their unused registries (or unused portions) to introduce gold. Once accounted for by the registry, it becomes legal.

At the same time, especially in Perú, the slow progress of formalization programs acts as protections for illegal miners and facilitates the introduction of illegal gold into the Peruvian markets. Along with this, a special provision prohibiting prosecution of miners who are in the process of formalization, for involvement in illegal mining, acts as a negative incentive for miners to delay the process as much as possible and continue to introduce illegal gold into the legal supply chain.

However, having a more robust system, as is the case in Colombia, does not mean that all loopholes are closed. For example, in order to avoid fraudulent registries or the abuse of existing ones, Colombian authorities frequently contrast their artisanal miners registry against other databases (e.g. special social services, to which only low income population have access to; or the tax registry) to identify and filter out fraudulently registries.

However, given the lucrative nature of the business, criminals continue to invest increasingly amounts of resources to enhance the complexity of their fraud schemes. The case of aka Robert in Colombia is indicative of this trend — After noticing that authorities were screening the artisanal mining registry against other data bases to identify cases of fraud, Robert accessed private government data through corruption in a series of municipalities in the North East region of the country. Through a complex

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<sup>14</sup> Colombia's registry establishes a cap for artisanal miners of 35 grams per month and 420 grams per year.

process of data analytics including municipal tax and social services censuses, he identified over 5,000 individuals whose socio-economic conditions would allow them to register as miners and report the 420 grams limit every year without raising suspicion by the government. This is, people who in spite of registering the annual quota, would not have to pay any tax for it (in the absence of other income), and would not lose access to social services designed only for low-income populations. During the years of operation, he was able to export about 8 tons of gold using this scheme. He was identified, because out of the 5,000 people he was using, a few went over the tax paying threshold and were contacted by government by the fiscal authorities because of their gold producing activities.<sup>15</sup>

Intermediaries who aggregate large numbers of small quantities are also a key link in the laundering of gold. These intermediaries are the gateway of artisanal gold into the formal supply chain and are located in the vicinities of artisanal mining sites, which are usually located in isolated regions. Fraud to introduce illegal gold into the system at these aggregator shops is common. This is usually done through falsified documents and the use shell companies. The case of Madre de Dios, Peru in 2019 shows the extent of this practice. There, the Environment Division of the National Police launched Operation Mercury, with the aim of dismantling a network of these aggregating shops, also known as financial centers. What they found was a large-scale illegal mining operation, carried out by over 10,000 illegal miners who sold their produce to 3,000 foremen, who in turn sold the aggregated gold to some 65 financial centers along the Inter-Oceanic highway connecting Peru and Brazil. Using forged documents and a complex network of shell companies, these financial centers would send the gold to Lima, Brazil and Bolivia and the money would flow through legal financial channels.<sup>16</sup> This practice is also common in Colombia.<sup>17</sup>

Gold smuggling into and out of Peru and Colombia is also a usual way to clean dirty gold. The illicit transportation of the mineral across international borders circumventing taxes and other restrictions, usually takes place via air transport, but many cases of gold smuggling by foot have also been identified. Gold smuggling along the border between Colombia and Venezuela is common and, as shown in the sections below, one of the hubs for this trade was the city of Cucuta, where a small number of companies bought illegal gold coming from Venezuela and legalized it through falsified documents and registered exports of 68.2 tons worth a total of 2.6 billion US dollars between 2010 and 2019. This route was shut down, at least formally, after the US government signed an Administrative Order targeting any person or entity dealing with Venezuelan gold.

Another interesting case was that of a criminal group known as ‘The Carats’, who smuggled illegal gold out of Colombia into Panama and back.<sup>18</sup> The process began in remote areas of gold production, where a group of jewelry shop owners bought illegally sourced gold directly from miners to be shipped illegally in to Panama. The smuggling took place with the help of corrupt airport officials (security, customs, or migration) who would get the gold across the screening sites and hand it over to human carriers at the gates. In other cases, gold was bathed in silver or steel to give a different appearance, shaped into chains, bracelets or belt buckles and carried through all the security check points in both

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<sup>15</sup> Urrea, Angela (2022) *Cayó 'Robert', señalado de usar nombres de más de 5.000 personas del Sisbén para exportar oro ilegal*. Noticias Caracol. <https://noticias.caracol.com/colombia/cayo-robert-senalado-de-usar-nombres-de-mas-de-5-000-personas-del-sisben-para-exportar-oro-ilegal>

<sup>16</sup> Paz, Oscar (2019) *Madre de Dios: tras el rastro de los culpables de una década de devastación de la minería ilegal*. El Comercio. <https://elcomercio.pe/peru/madre-dios-rastro-culpables-decada-devastacion-mineria-ilegal-noticia-ecpm-643220-noticia/?ref=ecr>

<sup>17</sup> See: <https://www.elcolombiano.com/especiales/tras-el-oro-turbio/comercio-oro-ilegal>

<sup>18</sup> Fiscalía General de la Nación (2019) *La ruta ilícita de ‘Los Quilates’*. At: <https://www.fiscalia.gov.co/colombia/noticias/la-ruta-ilicita-de-los-quilates/>

airports. Once in Panama, the gold (sometimes reported to customs) was sold to a group of trading companies who would pay in Italian gold jewelry, which was in turn, smuggled back into Colombia as part of the human carriers' luggage, to be finally sold at jewelry stores all over the country. In three years of operations, it is estimated that The Carats smuggled over US\$ 4 million worth of gold.

Finally, illegal gold is also frequently laundered through medium and large-scale mining operations. The process is simple — license holders would be approached by illegal miners to launder gold by making it seem as part of their mine's production in exchange for a fee. In a similar process license holders can buy illegally sourced gold at lower than market prices and formalize it through their operations and gain the premium. The Sanchez-Paredes Clan in Peru, was known to engage in this sort of operations and for using them to also launder money from the illegal trade in cocaine. Their case involved political corruption to keep their businesses moving, and when facing justice to try and avoid conviction.<sup>19</sup>

Once the gold is introduced to the respective mining registries, it is considered legal and it becomes available to satisfy global demand. The following section diverts the attention of the study from gold into its international trade, and presents the findings of a set of analyses based on trade statistics that produce methods to identify potential cases of illicit financial flows.

#### *iv. Analysis of Trade Statistics*

The results presented in this section are derived from the analysis of international trade data between Colombia and the US and Peru and the US, at the national and shipment data between 2010 and 2021.<sup>20</sup> National data was reviewed to execute a partner-country discrepancy analysis and identify gaps between data reported by the exporters and those reported by importers, between 2012 and 2020, in order to raise attention concerning potential cases of mis-invoicing. These data were also used to analyze discrepancies between production and export totals and identify potential cross-border smuggling cases. These national level analyses used data accessed through the United Nations COMTRADE,<sup>21</sup> a database that consolidates the annual reports that approximately 200 countries provide on their yearly trade and details the commodities by categories (HS Codes) and partner countries. Data on margins between free on board (FOB) and cost, insurance and freight (CIF) come from the OECD Database on International Transport and Insurance Costs (ITIC),<sup>22</sup> which details the bilateral, product-level international trade and insurance costs for individual products by HS codes.

Import and export data at the transaction level between 2016 and 2021 were also analyzed. This information was accessed through Panjiva, a company which organizes data provided directly by national custom agencies. Export data reported by Colombia includes information on US importers what allows for the analysis of both US and Colombian businesses. On the other hand, Peruvian statistics only include national exporters, so the analysis of the bilateral trade between Peru and the United States, is limited to Peruvian businesses. On its part, the US only reports trade data of transactions pertaining to commodities transported by sea, so given the fact that most of the trade in

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<sup>19</sup> See El Comercio: <https://elcomercio.pe/noticias/clan-sanchez-paredes/>

<sup>20</sup> Time frame of each analysis varies depending on the availability and relevance of the data. This is, longer time frames are used to show historical trends in trade, but shorter, more recent periods of time are analyzed to show current dynamics useful to enforcement efforts.

<sup>21</sup> See: <https://comtrade.un.org/>

<sup>22</sup> See: [https://stats.oecd.org/Index.aspx?DataSetCode=CIF\\_FOB\\_ITIC](https://stats.oecd.org/Index.aspx?DataSetCode=CIF_FOB_ITIC)

gold is done by air, there is no US data to analyze.<sup>23</sup> All analyses were based on figures reported using the Harmonized System 7108 code, which aggregates all related categories (i.e. gold powder, unwrought gold, semi-manufactured gold, and monetary gold).

Trade data analyses were complemented with the execution of 28 semi-structured expert interviews in both, Colombia and Perú. Interviewees come from the auriferous sector, the government, and academia. They were identified using a snow-ball sampling technique, and selected given their knowledge and experience in the gold trade business.

The aim of this analysis is to employ existing and develop novel methodologies that produce can produce red flags that could point to potentially unlawful actions during the trade in any commodity. In the particular case of the gold trade from Peru and Colombia to the US, it is hoped that the red flags identified here, would provide DHS with entry points for further analysis, investigations and potential judicial action, all contributing to the disruption of this illegal activities.

#### a. United States – Colombia Trade Statistics

Colombia’s gold production is modest when compared to other auriferous countries. On average, the country has produced 35 tons of gold per year during the last decade and most of this production has been exported to the United States. Although US participation in the purchase of Colombian gold has decreased in relative terms during the past few years, it is still the main buyer of Colombia’s auriferous production (fig 3); hence the importance of the following analyzes.

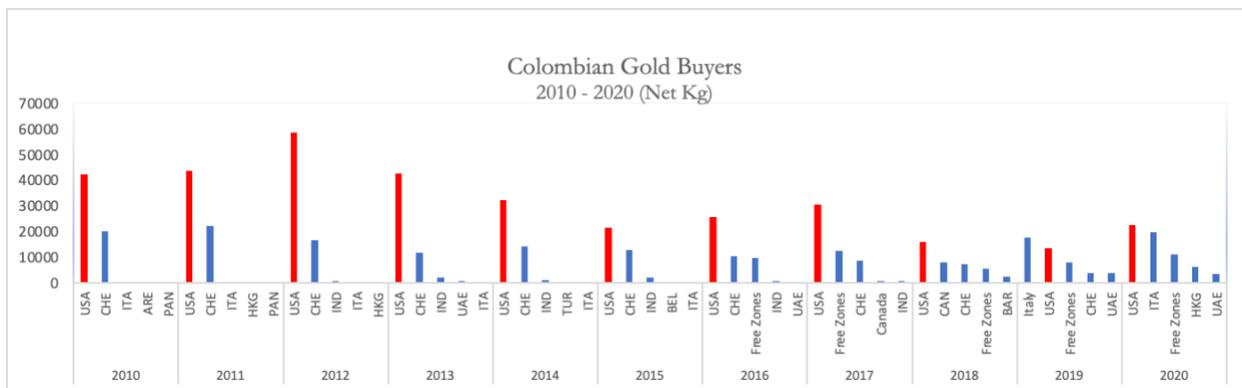


Fig. 3

#### Discrepancy Analyses

Trade Discrepancy Analysis (TDA) compares the reported bilateral export flows of one country to the respective reported import flows of the partner country. Ideally, the value of the two trade statistics should differ only by the cost of insurance, and freight (CIF), which is assumed, paid and reported by

<sup>23</sup> Section 431 of the Smoot-Hawley Tariff Act of 1930 requires all vessels arriving in the United States to maintain a manifest recording information about the preceding voyage and cargo carried during the journey. In a particular interpretation of this clause, the US Government considers that it only applies to maritime vessels, so no data is made available on trade arriving by air cargo. This interpretation was recently upheld by the US District Court for the Southern District of New York - Case No. 1:17-Cv-17-8269: Panjiva Inc. and Trade Data Services Inc. v. US CBP, US Department of Treasury.

the importing party.<sup>24</sup> Discrepancies can also arise due to valid logistical or statistical reasons, such as exchange rate volatility (both between trade partners and vis-à-vis the currency reported in the United Nations International Trade Statistics Database), uncertainty in terms of the quality, destination mismatches, different classifications for the same good, lagged reporting and currency valuation, and/or simple human mistakes (UNCTAD 2020).

However, mismatches, especially those that alter otherwise stable patterns, between the exporting and the importing reports can also be result of deliberate trade mis-invoicing (UNCTAD 2020), a key method for illegal movements of value across borders, commonly known as illicit financial flows (IFFs). When this is the case, trade discrepancies can evince money laundering (GAO 2020), capital control evasion (Liu, Sheng and Wang), subsidy abuse (Schuster, Carlotta, and Davis 2020; Pardo-Herrera 2021), tax evasion (Das, Meriluoto, and Rice 2020), or "counter-valuation" or the settling of accounts between underground or alternative remittance brokers (Cassara, 2018). Although it is not definitive, trade discrepancy analysis is a useful method to identify red flags related to potential cases of trade mis-invoicing, the related illegal activities that drive those cases, and the corruption that enables both.

National trade data between Colombia and the United States show a fairly stable pattern of gold trade reporting during the years under study. In broad terms, these statistics depict a consistently decreasing gold trade flow between the two countries between 2012 and 2019, going from approximately 62 tons and 3 million USD in 2012 to about 12 tons and 500,000 USD in 2019. There has been a slight increase during the last two years (2020 and 2021) reaching 27 tons and 1.5 million USD (Figs 4 and 5).

However, there is a significant difference between what the US reports as imports, both in terms of value and weight, and what Colombia reports as exports during the years of 2015 and 2016. During this period of time, US statistics report values about 50% above those reported by Colombian customs. Although trade discrepancy analysis is not *per se* conclusive of any illegal activity, it does show irregular patterns, such as this one, that represent points of entry for further legal examination and criminal investigations.

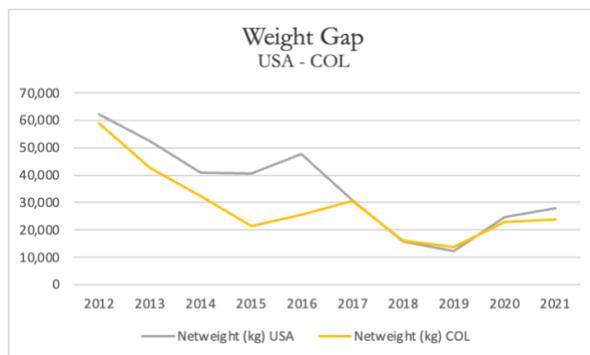


Fig. 4

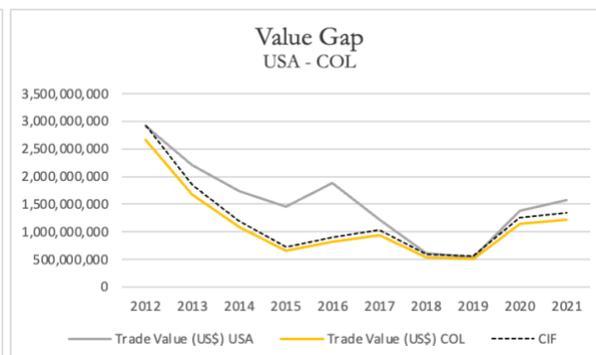


Fig. 5

This discrepancy can be looked at either from the export side of the transaction, in which case less money is received by Colombian exporters than goods are sent. If it were explained by a case of mis-invoicing, gold would leave the country, but a portion of the payment is not reported and instead concealed in US accounts, thus enabling irregular capital flight. Artificially lowering the values of the

<sup>24</sup> For the purposes of this study CIF values are only shown indicatively, as CIF trade only applies to goods shipped by sea, and gold is mainly shipped by air.

exports can also enable tax avoidance, depriving governments of needed funds to promote economic development and strengthening national security. This practice can also be used to gain from fluctuations in foreign exchange markets.

Conversely, if imports are over-valued relative to the exports, more money is sent out of the US than gold is received. This can be used to avoid capital controls and disguise capital out-flows as a form of trade payment (WCO 2018). By overstating the value of the trade, importers send the excess funds to foreign accounts instead of paying for actual imports. Over-valuing imports can also be used to inflate production costs, which can lower a company's tax liability.

Using national level trade data, it is also possible to explore for potential cases of commodity smuggling by looking at discrepancies between production and exports. In principle, exports should not be higher than production, so trends in the opposite direction should raise flags in terms of potential illegal activity. It is important to bear in mind, however, that it is possible for countries to import gold and re-export it, as is the case of Switzerland, where several of the most important gold refineries are located and is therefore one of the most important gold exporters in the world without really having any considerable mining activity. Still, controlling for this variable, figure 6 shows that since 2017 the country exports on average 11 tons more than what it produces (25% on average), a discrepancy that could be explained by smuggled gold coming into the country from neighboring countries, as detailed in the next section.

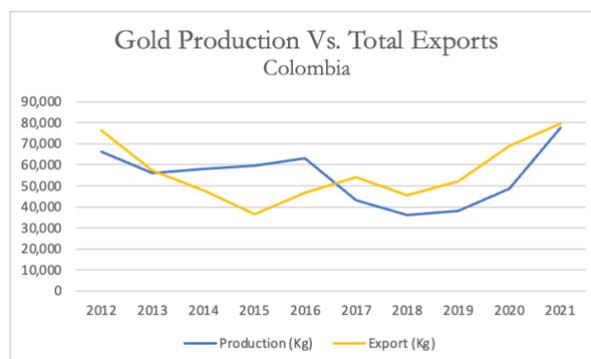


Fig. 6

### *Analysis by location*

Trade data at the transaction level allows the possibility to filter the location of the shipper. Although it is possible to start a business anywhere in Colombia, due to logistical needs, it is usual that gold exporters locate their offices either in municipal capitals close to mining clusters (from which gold is then taken to any of the several ports of lading), or directly at the ports of lading. Gold exporters that do not follow these trends are unusual and therefore invite further detailed analysis.

From January 2010 to February 2021<sup>25</sup> there were close to 20,000 official gold shipments from Colombia to the world. Of these, 7,672 were cases of exports directly to the United States. Seven percent of exports to the US (578 cases) were made by companies that reported to be located in the city of Cúcuta, which is not in the vicinity of any gold mines, has not been a port of lading since 2011,

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<sup>25</sup> The most updated information at the moment of the analysis

but is the most important city along the 2,200 kilometers of the border shared by Colombia and Venezuela, through which smuggling of goods is common.

Between January of 2010 and February 2021, a total of 578 gold shipments (Fig. 7) took place through the Cúcuta-US route. This trade involved 22 businesses in both countries (Fig. 8), amounted to 68,2 tons of gold (Fig. 9), and reached a total of 2,6 billion US dollars (Fig 10).

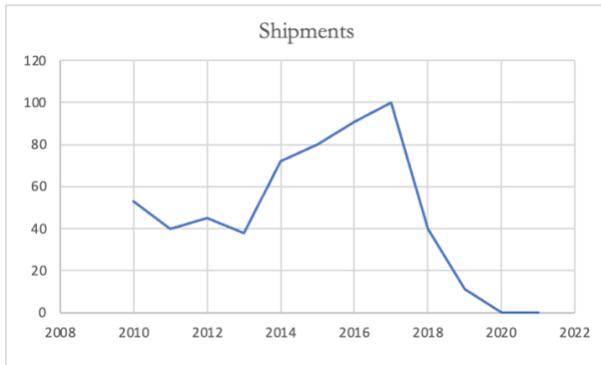


Fig. 7

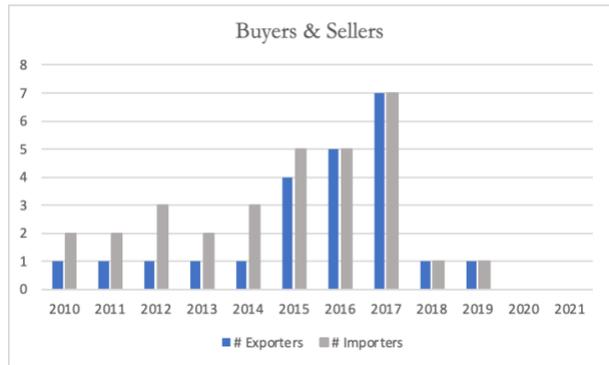


Fig. 8



Fig. 9



Fig. 10

Nine Colombian businesses participated in the trade in gold from Cucuta to the USA during this time.<sup>26</sup> One of these companies, CIJ Gutierrez, concentrates eighty percent of the shipments; the remaining twenty percent is distributed among 8 other businesses that also report to be located in Cucuta, but send gold only during three years, between 2015 to 2017 (see Fig. 8). A Google Maps search for the addresses reported by CIJ Gutierrez in all of its shipments since 2010, shows a facility that does not correspond to a legitimate multimillion-dollar company (see Pic. 1). The other 8 companies, which had not exported before 2015 and never did so again after 2017, all report the same address, which according to Google Maps data looks more like a humble family house in a distressed community than the headquarters of a conglomerate of businesses trading hundreds of millions of dollars a year in gold (see Pic. 2).

<sup>26</sup> C.I.J Gutierrez, Explotacion Inteligente Minera, Gold Power Colombia, Stephan Joyeria, Colombian Fine Gold, Dorados y Plateados Raby, Fenix Precious Metals, Gold Premium International, Ultra Emerald8



Pic. 1



Pic. 2

At the other side of the transactions, purchases of gold through this route are also significantly concentrated. Thirteen businesses in the US buy all of the gold coming in from Cúcuta,<sup>27</sup> but only two of them (Asahi Refining USA Inc., and Johnson Matthey Inc.) concentrate 90% of all trade from this city between 2010 and 2021 (see Fig. 11).

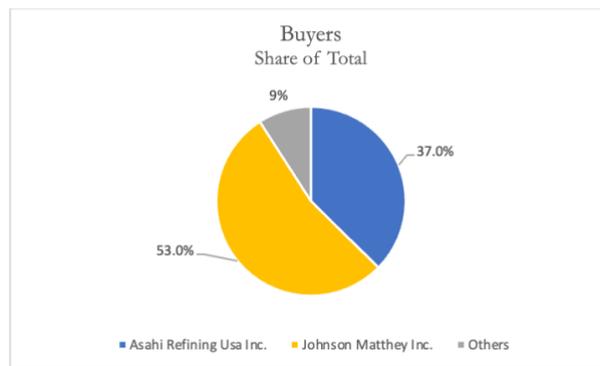


Fig. 11

A very significant drop in the volume of gold trade from Cúcuta took place after 2018. This is especially true in terms of the amount of gold traded, which dropped from 5.5 to 1.2 tons, and the consequent corresponding value of the trade, that went from US \$203 million in 2018 to US \$47 million in 2019. This decrease in the volume of trade can also be seen in the number of shipments, that went from 100 in 2017 to 40 in 2018, and then to 11 in 2019. No shipments were recorded after that. Gold trade through this route during 2018 and 2019 only involved CIJ Gutierrez in Cúcuta and Asahi Refining Inc. in the USA. These two companies traded approximately 6.8 tons of gold, for a total of US \$250 million in the two-year period.

This drastic decrease in trade, which can also be understood as the end of a smuggling route, could be explained by the series of sanctions imposed by the US Government against the Government of Venezuela. In particular, Executive Order 13850 -signed in 2018- targets entities that benefit from dishonest or fraudulent conduct, illicit activity, and/or deceptive transactions within Venezuela's gold sector.<sup>28</sup>

<sup>27</sup> Johnson Matthey Inc., Asahi Refining USA Inc., International Commodities Inc., International Fc Stone Ltd., Johnson Matthey Inc., International Commodities Inc., Republic Metals Corporation, Universal Precious Metals Inc., Atomic Gold, Sun Valley Industries, Worldview Capital, Infinite Stones International Inc., Trinity Group Management.

<sup>28</sup> See: [https://home.treasury.gov/system/files/126/venezuela\\_eo\\_13850.pdf](https://home.treasury.gov/system/files/126/venezuela_eo_13850.pdf)

### *Analysis by Trade Value*

Trade data at the shipment level also allows for bottom-up approaches to identify discrepancies between the reported value of the trade and the global market price of the commodity. This method is commonly known as the Price Filter Method (PFM), through which a price filter can be estimated for any commodity and used as a proxy for arm's length prices. Any trade significantly above or below this price filter should deserve closer analysis, as it may be related to cases of trade mis-invoicing.

Just as any other method, given its statistical essence PFM has some limitations and can therefore only raise red flags, not point to actual crimes being committed. For example, given that price filters are estimated using a universe of transactions (including those at abnormal prices), there will always be transactions falling outside the statistical filter. Also, the heterogeneity of commodities, even when classified with the same HS code, will necessarily produce a different price between shipments, that could be picked up as abnormal, when they could simply be the expression of difference in quality. Finally, PFM cannot identify legitimate unusual prices that may be explained by contractual specificities, such as long-term commercial commitments, or transactions between businesses of a same conglomerate. Notwithstanding the importance of these methodological drawbacks, these can be accounted for and successfully addressed when using PFM.

Now, for the particular case of gold, most of these limitations do not apply. The fact that a global gold price is established and publicized daily provides a precise standard against which to assess transactions. Also, the practical inelasticity of the global demand for gold suggests that there will be no shortage of buyers, and therefore there would be no need for special contractual specificities that could result in alterations to the price. This is especially true, as National Central Banks are also permanent buyers of gold, so in the very unusual case that an exporter would not find a buyer for its produce, there would always be the possibility to sell it to the central bank at the standard global price. Finally, there is still the possibility of heterogeneity in the different shipments analyzed (i.e., difference in purity, or other mineral components of the shipments). However, that can be addressed by the different thresholds through which the price filter is established, as shown in the next paragraphs.

According to most interviewees<sup>29</sup>, possible explanations for a seller to export at a lower value than the global price, are difficult to come by. In fact, all of the interviewees who had direct experience in the gold trade, maintained that the international market functions quite in the opposite way, and that demand for gold is such that “buyers basically snatch gold from each other when they find it”, as one of them put it. This is why stable, bilateral, long-term commercial relationships between buyers and sellers are easily identifiable in global gold trade statistics.

Nevertheless, in order to control for potential heterogeneity that could explain abnormal prices between the shipments analyzed, the paper established different filters at 10, 20, and 30 percent below global market value. It analyzes shipment-level data from September 2016 to February 2021 between Colombia and the United States.<sup>30</sup>

During the period under study, a total of 3160 shipments of gold left Colombian ports destined to the United States. A total of 283 —nine percent— of these exchanges, weighting approximately 16 tons,

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<sup>29</sup> A small number expressed not having enough information to comment on this particular issue.

<sup>30</sup> Outliers were discarded assuming they corresponded to reporting errors, when clearly identified. For example, a shipment reported weighting 2,9 tons and valued at US\$115,800 at a time when the international price was at \$38,000/kg, can easily identified as a reporting mistake, where instead of 2,9 tons, the shipment must have been for 2,9kg.

were paid at 70 percent or less of the global gold price at the time of the transaction (fig. 12). This means that instead of producing 551 million USD, this trade produced a total of 281 million USD, a difference of 270 million, or what is the same, 50 percent less of the value it should have. 505 shipments —sixteen percent— paid 80 percent or less of global market price at the moment of the transaction, producing 396 USD instead of 802 million USD. Finally, 1,470 shipments —forty five percent— were reported at 90 percent or less of the global market price, producing a difference of approximately 600 million USD between what it was paid, and what it should have been paid.

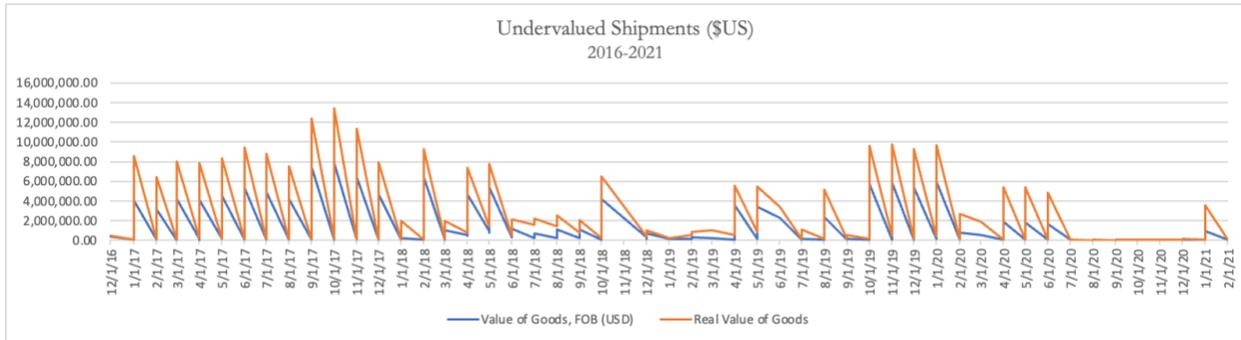


Fig. 12

Under-invoicing —fraudulently altering the price of a shipment to report lower values— which may explain the differences identified and described above, is a common method used to transfer value abroad, as the payment for the good or service will be lower than the value that the importer receives when it is sold on the open market. This is one of the most common methods of illegally transferring value across borders and laundering the proceeds of crime, a method commonly known as Trade Based Money Laundering (TBML). Altering the price of a shipment to report a lower value, can also be used to shift money abroad to circumvent anti-capital flight regulations, or to avoid taxes or custom duties.

A total of 219 firms participates in this trade, but only a handful in each side of the exchange concentrate most of the undervalued shipments. From the export side, 85 percent of the undervalued shipments (at less than 70 percent of market price) is concentrated in five firms (Fig. 13). Those same firms concentrate 92 percent of the difference between what was paid and the market price (Fig. 14).



Fig. 13



Fig. 14

The picture is very similar at the import side, in the United States. There, six firms concentrate 86% of undervalued shipments (at 70 percent or less of market price) (fig. 15) and the same businesses explain 82 percent of the differences identified (fig 13). Given the stable commercial relationships explained above, all of these companies trade in couples, this is, a company in the United States buys most the production from the same company in Colombia during extensive periods of time.

For example, Sun Valley Industries,<sup>31</sup> which explains 40% of the difference, buys most of its undervalued gold from Zandor Capital. In the same sense, United Precious Metal Refining, which concentrates over 30% of the undervalued shipments, bought all of these from Metales Procesados Industriales. Other trading couples are Metalor<sup>32</sup> and Continental Gold; Atomic Gold and Metales Procesados Industriales; Republic Metals Corp. which buys most of the undervalued gold from Red Eagle Mining and Continental Gold; and United Precious Metal Refining, which buys all of the undervalued gold from Metales Procesados Industriales.



Fig. 15

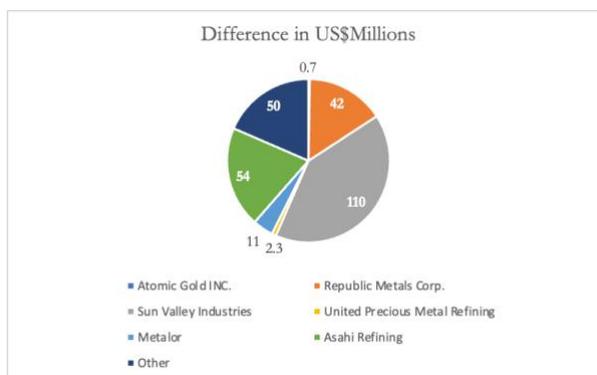


Fig. 16

The Price Filter Method can also be used to identify overvalued shipments. Just as in the case of undervalued trade, fraudulently altering the price of a commodity to report a higher value can also be used to launder money, to avoid taxes, abuse subsidies or to send/receive value across borders to circumvent capital flight regulations. Overvalued trade is also identified in the data analyzed; however, the magnitude of this phenomenon is less significant as the undervaluing of gold. During the period of time under study, a total of 19 gold shipments were sold at a price over 30 percent the market value, and reported 9.2 million USD instead of the market value of 4.9 million USD.

<sup>31</sup> In 2015, Sun Valley acquired CI CIGSA, a Colombian subsidiary of Fundición Gutierrez, a company known for its links to money laundering from illegal mining. See: <https://mneguidelines.oecd.org/Antioquia-Colombia-Gold-Baseline-EN.pdf> and <https://es.insightcrime.org/noticias/analisis/empresarios-de-oro-de-colombia-usaron-mineros-falsos-y-muertos-para-lavar-dinero/>

<sup>32</sup> Metalor was involved in an organized crime and illegal mining money laundering scheme investigation by Peru's Public Prosecutor's Office in 2018. See: <https://ojo-publico.com/1113/metalor-financed-transport-tons-suspect-gold>

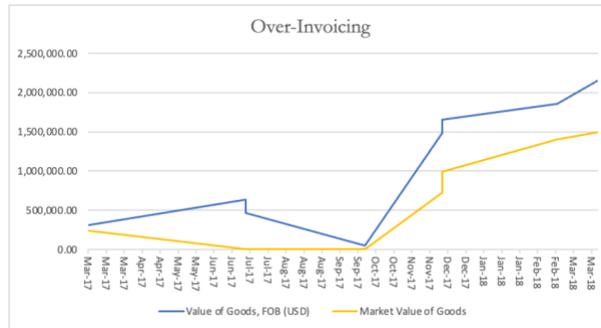


Fig. 17

In total, ten firms participate in these shipments, 5 exporters in Colombia and 5 importers in the United States. However, two companies, one in the US, Atomic Gold Inc., and one in Colombia, Metales Procesados Industriales, engage repeatedly in this type of overvalued shipments, and participate in 12 of the 19 overpriced transactions. In spite of this, these two firms explain a very small portion of the 4.3 million USD overpaid, since their 12 shipments—which take place all in October of 2017— never weighted more than 190 grams, a very small amount of gold which may not even cover shipping costs, as is detailed in the next section.

The larger portion of the difference between reported and market prices is explained through the trade of the remaining 8 companies. Two and a half million are explained through only four shipments between Comercializadora E Industrias Flama S.A.S. in Colombia, and IGR Americas Inc. and WPM International Llc. in the United States. Another 1.1 million USD is explained by the purchases made by Republic Metals Corp<sup>33</sup>, which paid 638,122.74 for 50 grams of gold worth 1,922.54 USD in 2017 from Continental Gold, and 467,975.56 USD for 20 grams of gold worth 770 USD, also in 2017, from Red Eagle Mining de Colombia.

### *Analysis of Shipment Data by Weight*

Gold shipped during the period under study ranges between 20grs and 337kg per transaction (fig. 15). On average, each shipment carries 28 kilograms of gold, but over 60 percent of all transactions are done for less than 20kg (fig.18). Analyses of shipments by gross weight show very similar patterns as those of gold. Gross weight of shipments range between 20grs and 346kg, and on average weight 29 kilograms (fig. 20). The distribution of shipments by gross weight shows that most are also below 20 kilos (fig. 21).

<sup>33</sup> In April of 2019, Republic Metals signed an agreement with the US Government after a money laundering investigation. See: <https://www.justice.gov/usao-sdfl/pr/united-states-government-and-cooperating-us-gold-refinery-enter-agreement-after-money> Later, in 2018, the company filed for bankruptcy which was approved by a judge in 2022. See: <https://www.orlandosentinel.com/business/os-bz-republic-metals-bankruptcy-20181224-story.html>

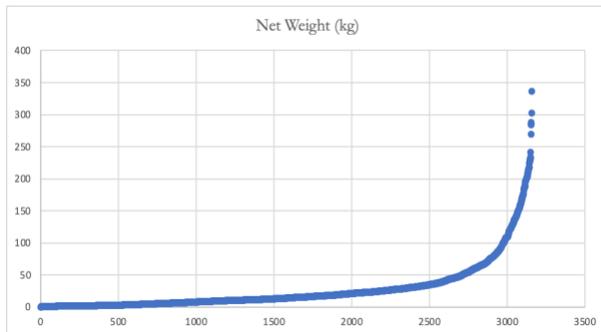


Fig. 18

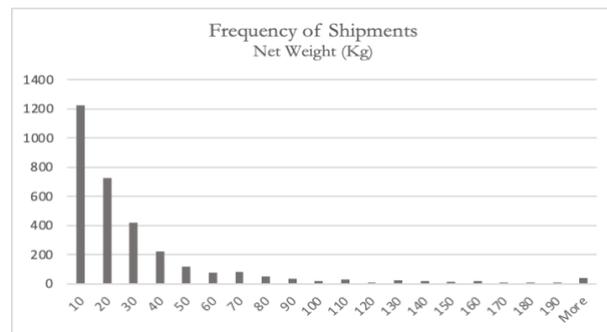


Fig. 19

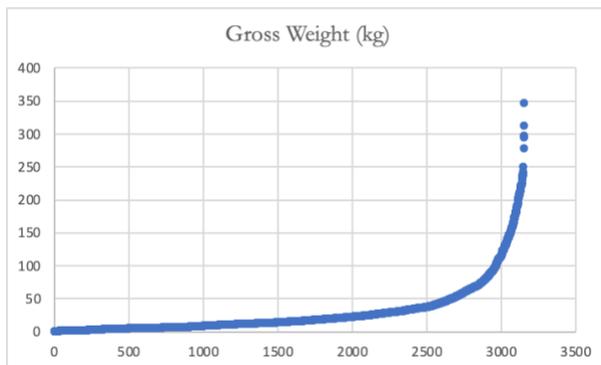


Fig. 20

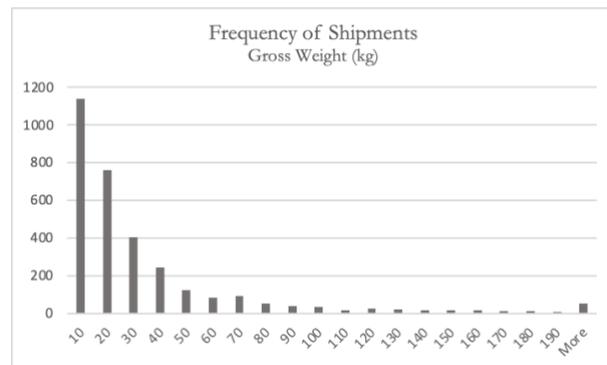


Fig. 21

However, this stable pattern is not found during the analyzes of the weight of the packaging in which the gold is shipped. The weight of the packing used to ship the gold can be established by calculating the difference between gross and net weights. When this variable is examined, it is possible to see that almost 10 percent of the total of shipments report the same value for gross and net weights, which suggests that the gold was shipped without any package. Thirty-four buyers in the US and forty-six exporters in Colombia participate in this 10 percent of shipments. Although this could respond to simple reporting mistakes, as mentioned, fraudulently altering the weight of a shipment is a method that could be used to illicitly transfer value across borders.

It is also noteworthy that only 5 buyers out of 34 in the US (15%) concentrate two thirds (67%) of these cases, and that the shipments of only 3 exporters (6%) explain 40 percent of these cases. Of particular interest is the case of WPM International Llc., a company located in Florida and Comercializadora E Industrias Flama S.A.S., located in Bogotá. Although WPM had been buying gold since 2016 (a total of 158 shipments), from 17 other Colombian exporters, it bought 22 loads of gold from Comercializadora E Industrias Flama between October 2017 and December 2018, all of which seem to have been shipped without a package. No further trade took place between these two companies, and according to the data analyzed, Comercializadora E Industrias Flama, did not trade again.

Another notable finding, is the lack of a coherent relationship between gross and net weights. This is, the lack of a stable pattern in the packaging of gold shipments. For example, very light packaging of 60gr is used to ship gold loads weighting 150gr, and also cargoes of 13 kilos. In the same sense, shipments of 30 of 100 kilograms, use packing of 15kg. As said, although this lack of coherence could be explained by errors in reporting, or simply, by random packaging practices by each company, it

could also point in the direction of fraudulent alteration of the weight of the shipments to illegally transfer value across borders.<sup>34</sup>

In order to analyze these statistics, this relationship was standardized by estimating the mean of the weight of the packages in relation to the net weight of the shipments. On average, every gram of gold shipped, uses 0.2gr of package. The distribution of this parameter, shown in figure 22, indicates that most of the shipments (86%) use less than the 0.2gr average. The analyzes then classifies shipments one and two standard deviations above the mean, in order to identify clearly abnormal shipments. This is, those that report a gross-net weight ratio that visibly holds no relationship to most of its kind.

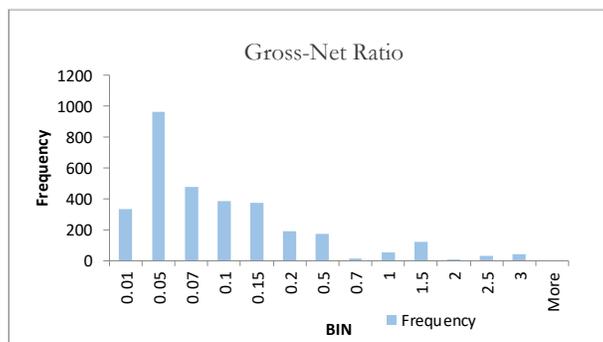


Fig. 22

We find that 254 shipments (8%) are located one standard deviation, and 195 (6%) are located two standard deviations above the mean.<sup>35</sup> In other words, while most shipments use 0.2 grams (or less) of package per every gram of gold sent, 254 shipments report using three times that weight, and 195 report using five times that weight. An example of this is a shipment between Metales Procesados Industriales in Colombia, and Universal Precious Metals Inc. in the US, on July 24<sup>th</sup>, 2020, in which 1.2 kg of gold were shipped in a package weighting 3.75 kg, more that 15 times the average used by all transactions between 2016 and 2021.

Now, the distribution of businesses involved in these transactions is also important to highlight. Of all the 254 shipments one standard deviation above the mean, 235 (92%) were sent from one company in Colombia, Metales Procesados Industriales (MPI), to two companies in the US, Atomic Gold Inc., and United Precious Metal Refining Inc (fig. 23). In terms of the 195 shipments two standard deviations above the mean, the distribution in terms of companies is the same, but in absolute terms, trade between these 3 businesses explain 96 percent of the abnormalities.

<sup>34</sup> Another potential explanation would be exports using other HS categories, such as HS711291, used for gold scrap. However, neither Colombia or Peru report exports under HS711291.

<sup>35</sup> These cases include both, unwrought gold (HS710812) and semi-manufactured gold (HS710813)

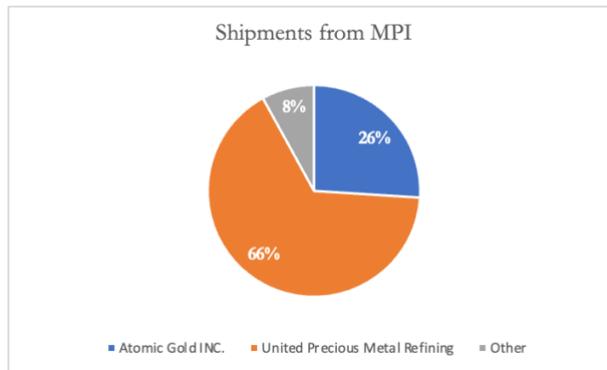


Fig. 23

### *Analysis of Shipment Data by Volume*

Shipment statistics report volume in twenty-foot equivalent units (TEU), a cargo capacity measurement used for the intermodal container system. Aside from being quite imprecise, as its dimensions are not standardized,<sup>36</sup> TEU is not an efficient volume measurement, since international trade in gold takes place by plane where containers are not used.

Nonetheless, having a volume variable reported allows its analysis and the subsequent identification of unexplained abnormalities. In order to do this, volumes reported in TEUs were converted into two variables expressed in cubic centimeters, each using the different height of the containers with which TEUs are estimated. Having values for weight and for volume allows the estimation of the density reported for each shipment.

This calculation shows that volume is not reported as measured, but instead is the result of an estimation using the net weight of the shipment. This is evident since the density estimated using the net weight value, is the same for all shipments regardless of the variation in all other measurements. In other words, the values reported in the 'volume' field are not the result of measurements, but instead, this field is populated using the density of gold, which is a constant, derived from the net weight of the shipment.

Although it was not possible to corroborate this conclusion (that the field is populated with information derived from the net weight and not from a measurement), most interviewees agreed on the fact that there is no other way to explain the fact that the density of all shipments is the same. Some of them even suggested that this may well be common practice to speed up the trade, since measuring the volume of each shipment would not only be expensive, but also, and most importantly, significantly time consuming.

Populating a field in the report with standard information in place of using the result of a measurement, not only renders such information useless, and affects transparency, but it also hinders the possibility to perform effective audits, and opens the possibility to abuse the reporting system for illegal means. In this sense, any type of commodity could be presented as gold, labeled with the corresponding 7108 HS code, and given a volume value estimated, not according to its dimensions, but according to the standard density of gold. This would make it possible, for example, to ship sand

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<sup>36</sup> Containers have twenty feet in length, but their height ranges between 4 feet 3 inches (1.30 m) and 9 feet 6 inches (2.90 m).



tons of gold, while the United States reported only 41 tons as imported that year; a gap of more than 232 tons of gold, worth over 9.1 billion USD at 2018 prices. During these three years a total difference of 488 tons is identified, reaching over 19 billion USD in value. A very similar pattern can be seen in Peruvian total exports to the world (fig. 28), where in 2018, Peru exported 550 tons of gold, but its trading partners all together reported imports for 311 tons during the same year. All of this took place while the country's production statistics kept their historical averages, and even slightly decreased from 153 tons in 2016 to 140 tons in 2018 (fig. 29).

Again, it is not possible to reach the conclusion of illegal wrongdoings from this analysis, as there are other possible explanations for these differences. However, as said, gaps of this sort which alter otherwise fairly stable reporting patterns, deserve further analysis. If the US government were to make air trade data available at the shipment level, a logical next step would be to review the import records of gold shipped to the US from Peru between 2016 and 2018 and contrast them with the data used for this analysis. The results would produce discrepancies at the shipment level and allow for the identification of the participating businesses. Nevertheless, as shown in subsequent sections, available data allows for other analyzes to contribute to the explanation of this large gap.

Now, fraudulently overstating the value or the weight of exports is a method that can be used to move value into countries, and usually referred to as an illicit financial IN-FLOW. In cases like this, exports are artificially increased to show higher amounts of gold than what importers are actually receiving, and as a result more money comes into the Peruvian economy than what it is supposed to. It could also be the case that weight is being altered to report fake or phantom exports, and use exporting documentation to launder the proceed of other crimes. This method has also been linked to tax avoidance, subsidy abuse and trade-based money laundering.



Fig. 26

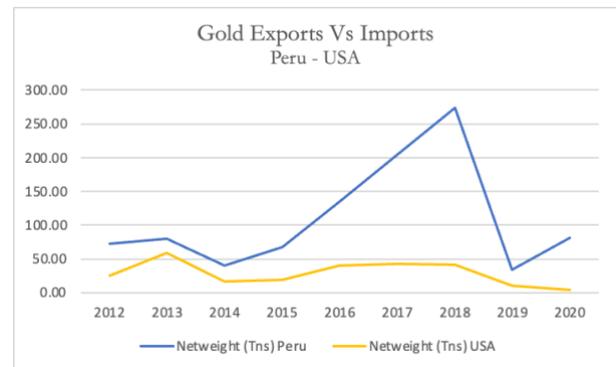


Fig. 27

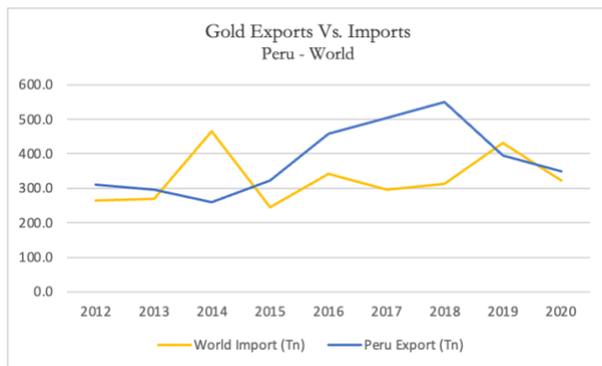


Fig. 28

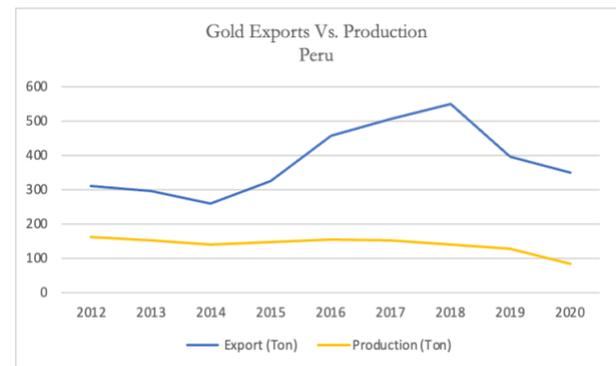


Fig. 29

## Gold Smuggling

The differences between production and exports (fig. 29), especially those experienced between 2016 and 2018 could be the result of gold smuggling.<sup>38</sup> The focus of the analysis is then set on Bolivia, since most of the Peruvian illegal production that takes place along borders is concentrated in the department of Madre de Dios, in limits with Bolivia. An analysis of Bolivia's data shows that, just as Peru's, production levels have remained stable and decreasing over the last decade (fig. 30). However, the discrepancies between production and exports data shows that after 2014, Bolivia started exporting extremely higher amounts of gold relative to those reported as produced in their legal mining sites (fig 31).

This spike coincides temporally with the decision made by the Peruvian government to ban mercury imports, often used in the illegal mining of gold,<sup>39</sup> and it also concurs with Bolivia's mercury imports, which increased in the same proportion (Fig. 32). What these data suggest, is that an important portion of Peruvian illegal gold production could have shifted to Bolivia after the shortage of mercury. Figure 31 shows a significant spike in Bolivia's exports after 2014 with no real increase in production, which could also be explained by illegal mining. This surplus of gold could contribute to explain both, the gap in the weight of exports from Peru to the US between 2016 and 2018, and the difference between production and exports, which escalates during those same years.

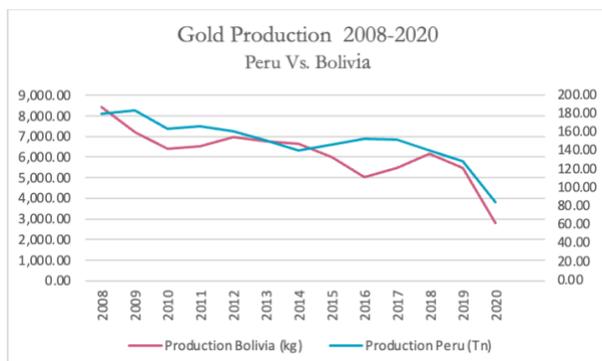


Fig. 30

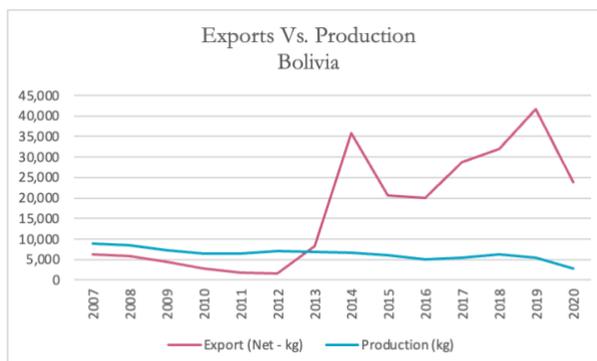


Fig. 31

<sup>38</sup> These differences could also be explained but different measurement techniques that aim to capture the exact weight of the gold, without incorporating that of other minerals that may be embedded in the rocks extracted from the mines. If stricter measurements take place at production rather than at exports, production measurements would only be reporting pure gold, while exports may be reporting the gross weight, this is, the gold plus the other minerals.

<sup>39</sup> Peru signed the Minamata Convention in late 2013 and the agreement was ratified by Congress in in January of 2016 and it entered into effect in August of 2017.

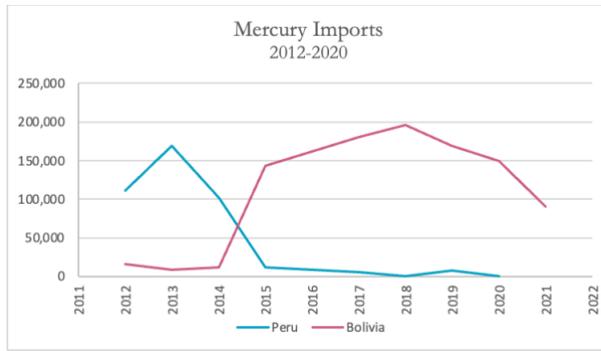


Fig. 32

*Analysis by Trade Value*

Just as in the section on Colombia, the analysis of trade data between Peru and the US uses shipment level information using HS7108 code, to contrast the value reported against the current global gold price at the moment of the transaction. Also, to control for potential heterogeneity that could explain abnormal prices between the shipments analyzed, the paper established different price filters at 10, 20, and 30% below global market value. It analyzes shipments with a value of 70% or less of the global price from January 2016 to December 2021 between Peru and the United States.

During the years under analysis, Peru exported to the US approximately 820 tons of gold worth close 8 billion USD, in 7790 shipments. Out of these, 2253 shipments (29%) report values at 70 percent or less the international price of gold. At standard international prices, this trade should have produced over 35 billion USD, a difference of approximately 27 billion (fig. 33).

The dynamics of data on undervalued trade (fig. 33) resemble closely those of the weight gap between exports and imports shown above and again in figure 34.<sup>40</sup> Given that the analysis on trade value gap (fig. 26) shows no significant difference, what the result of this analysis seems to suggest is that this extremely large gap in the value of shipments may not be the result of underpricing, but of overestimating the weight of the exports, which, for the purposes of illicit flows of money, would produce the same effects.

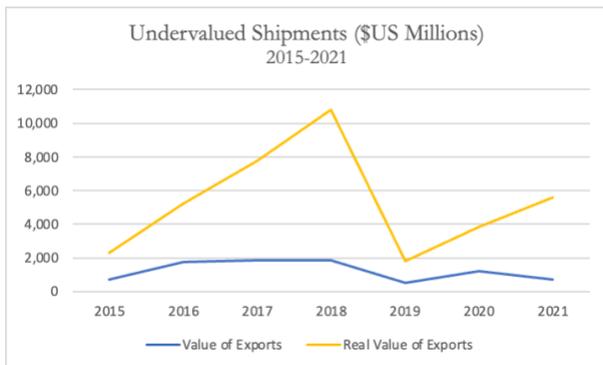


Fig. 33

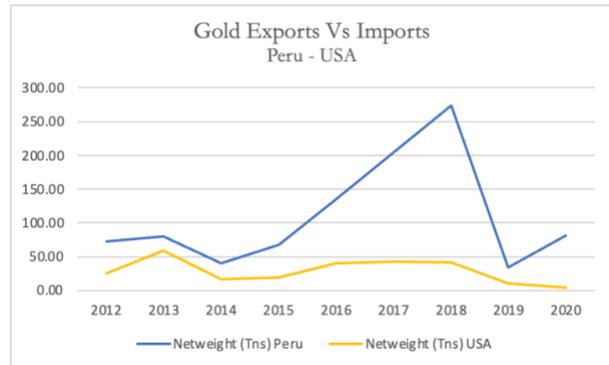


Fig. 34

<sup>40</sup> This same figure is also included in a prior section as figure 27.

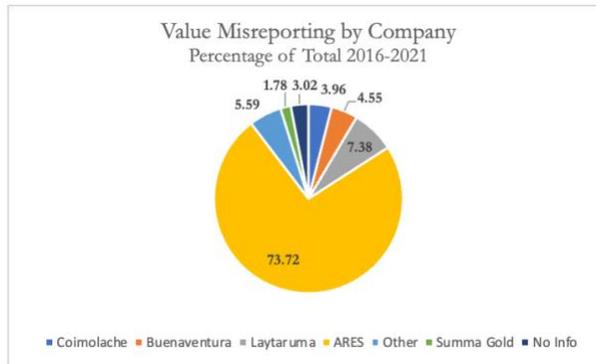


Fig. 35

A look at the businesses involved in this trade between 2016 and 2021 shows clear patterns (fig. 35). During the time under analysis, Peruvian firm Compañía Minera ARES, reported 109 shipments to the US weighting a total of 498 tons at a value of 896.8 million USD. However, at the average yearly price international price, such amount of gold should have produced 20.7 billion USD.

Another example is Minera Laytaruma, which undervalues 62 percent of its shipments. These misreported cases make up for approximately 40 tons of gold and were valued at 227.3 million USD, when at international prices they were worth over 2.2 billion USD.

Compañía De Minas Buenaventura (CMB), another company, sent 51.5 tons in 101 shipments and reported 832.4 million USD in sales. However, 18 of those shipments were valued at prices lower than 70 percent the international gold price. This sample of 18 cases concentrates 33.2 tons and 89.4 million USD, but at standard prices, these 33.2 tons should have produced 1.3 billion.

Note that these three companies alone explain over 85% of the value gap. However, since there is no US data available, there is no way to know what businesses they were dealing with in the US. In the same sense, given the lack of US information, there is no possibility to analyze the gap in reported weights between Peru exports and US imports, which would confirm (or discard) the hypothesis about overreported weight, instead of underpriced gold, which would provide another approach into the phenomenon.

As said, by artificially increasing the weight of shipments —if that is the case— exporters report higher amounts of gold leaving the country than what is really being received at the other side of the transaction. As a result, more money comes into the Peruvian economy than what it is supposed to. In contrast, fraudulently lowering the price of gold —if it were— is a common method used to transfer value abroad, as the payment for the good or service will be lower than the value that the importer receives when it is sold on the open market. If the result of mis-invoicing, either method would be producing illegal flows of money, which could possibly be linked to an extremely large case of money laundering.

Finally, there are very few shipments that report values over 30 percent international prices —33 of 9,300 in total. Out of these, only two are destined to the US and account for less than 500,000 USD in difference.

### *Analysis of Shipment Data by Weight*

Net weight of shipments reported from Peru destined to the US, range from 2 grams to 7,1 tons. On average, each shipment carries 104 kilograms of gold. However, most shipments (81%) carry 30 or less kilos of gold (fig. 36). In terms of gross weight, the parameters are similar, and shipments range from 2 grams to 7.6 tons. On average, gross weight of shipments is 110 kilos, but most (80%) weight less than 30 kilograms (fig. 37).

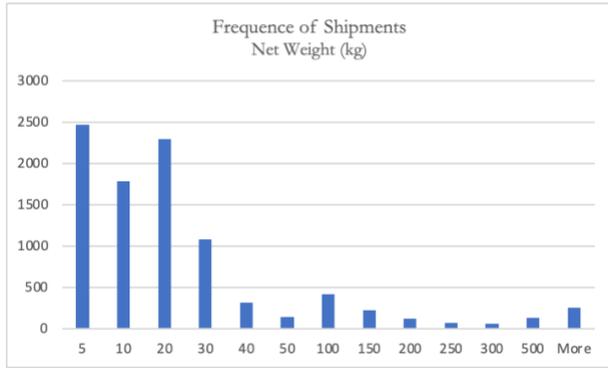


Fig. 36

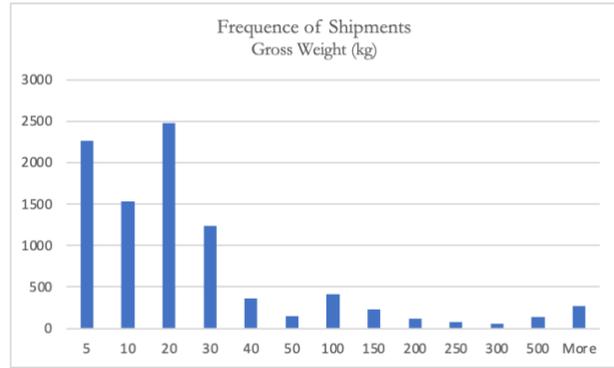


Fig. 37

Just as in the case of the analysis on Colombian data, the relationship between gross and net weights was standardized by estimating the mean of the weight of the packages in relation to the net weight of the shipments. On average, every gram of gold shipped, uses 0.12 grams of package. The distribution of this relationship, shown in figure 38, indicates that most of the shipments (76%) use less than the 0.12gr average.

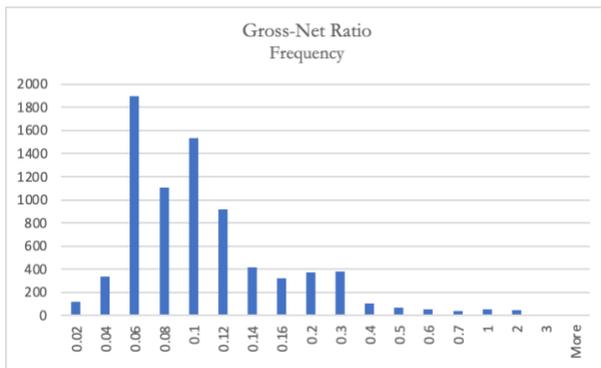


Fig. 38

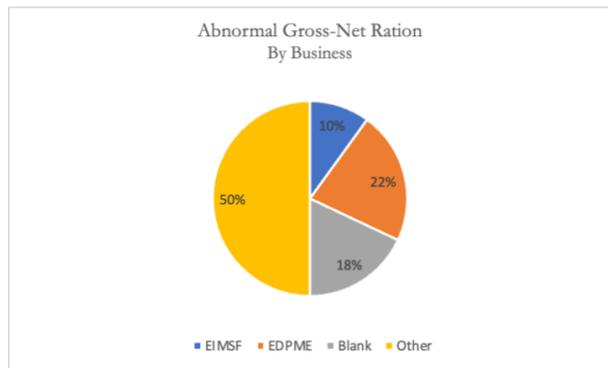


Fig. 39

As before, the analysis classifies shipments one and two standard deviations above the mean ratio, and find that in in this case, 3.4 percent (266 cases) and 1.2 percent (100 cases) do so respectively. Given the large extent of the trade between Peru and the US, these percentages do not represent a considerable portion of the trade.

Now, in terms of the concentration of cases among businesses, the analysis identifies two Peruvian firms that together concentrate 32 percent of the cases —Empresa Inversiones Mineras Santa Fe (EIMSF), and Entidad de Desarrollo a la Pequena y Micro Empresa (EDPME)— the remaining two thirds of the total cases are distributed among 38 other businesses and shipments with no data (fig.

39). Important to note is that out of all of EDPME shipments, 37 percent show abnormal net-gross ratios, and that in the case of EIMSF, this variable reaches 42 percent; all but negligible amounts.

*Analysis of Shipment Data by Volume*

Just as in the analyses in the section on Colombia, volumes reported in TEUs were converted into two variables expressed in cubic centimeters, each using the different height of the containers with which TEUs are estimated. Having values for weight and for volume allows the estimation of the density reported for each shipment. In contrast with the Colombian data, Peruvian values reported in the volume field seem to be the result of a measurement, as each shipment has a different density.

Also, no major abnormalities are identified when plotting the distribution of the densities of each shipment (using both measurements of TEUs). In this sense, figures 40 and 41 show how most measurements are very close to the mean value, which leads to think that packing processes are better standardized than in neighboring Colombia.

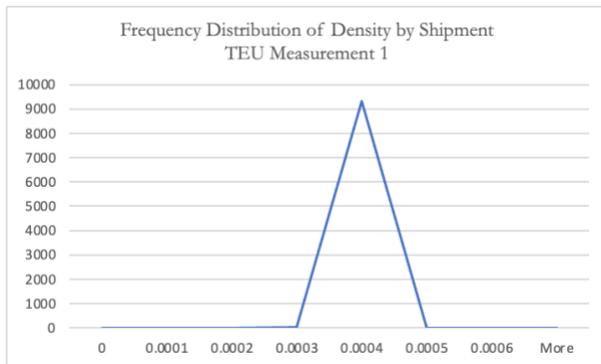


Fig. 40

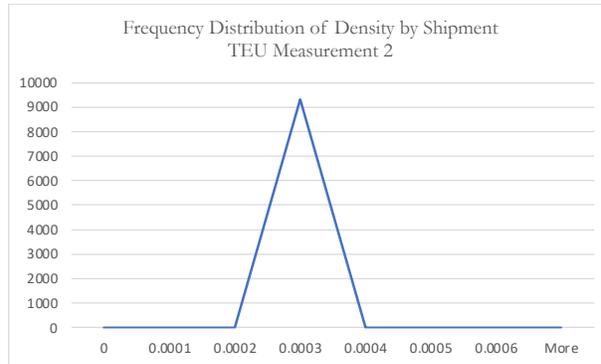


Fig. 41

However, a look at the averages of density values per shipment, per year, supports the hypothesis of phantom shipments expressed above. Given the relationship between the variables, by artificially overvaluing the weight of shipments, density values should decrease, as shown in figure 43. The trend of the average density of shipments is practically the opposite of the trend of the overvalued shipments discussed above, and shown again here in figure 43.

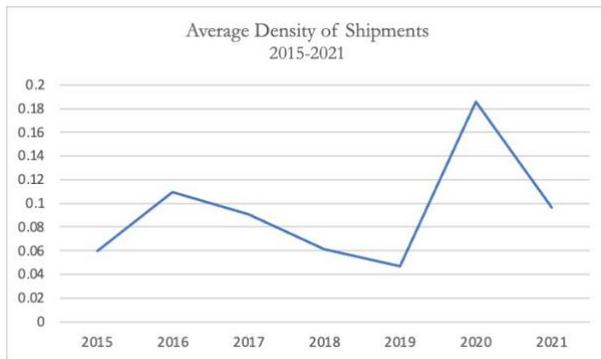


Fig. 42

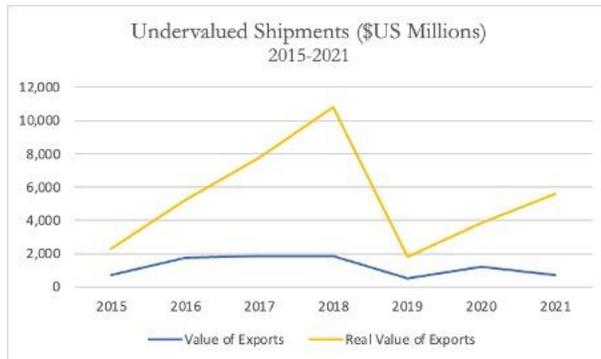


Fig. 43

By artificially increasing exports to show higher amounts of gold than what is actually being shipped, exporters could be abusing export subsidies, or simply using export certificates to launder the proceeds of other illegal activities. Again, having shipment-level data on US imports would significantly

contribute to the validation of this hypothesis, as it would be possible to contrast not only data on prices of shipments, but also of their weight.

### *Analysis by Company History and Trade Dynamics*

A total of 247 companies participates in the trade from Peru to the United States, and between 2016 and 2021 they reported having sent 820 tons of gold for about 8 billion USD. Two thirds of these companies shipped gold to the USA 20 times or less in the six-year period under study —3 times per year on average— and only 12 percent of companies have shipped over 100 cargos over the same time (fig. 44).

Data show that there is an evident concentration of large numbers of companies participating in the trade in a sporadic fashion. This could be explained by the creation of shell companies established with the purpose of engaging in the export of illegal gold, only to disappear after participating in a few shipments. The possibility to access the tax files of these companies online,<sup>41</sup> allows to perform further analysis and validate this hypothesis.

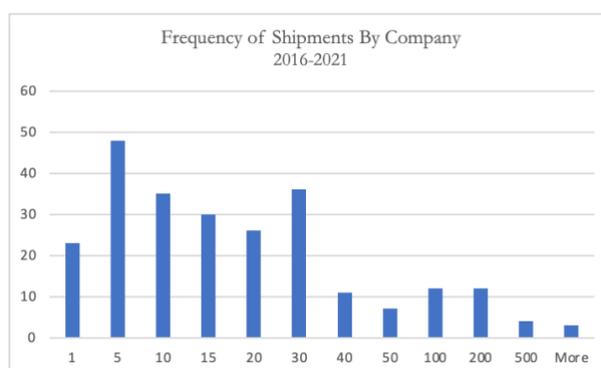


Fig. 41

Of the 247 companies, 161 show their respective tax registries active with no evidence of irregularities. However, in 52 cases the tax registries are either suspended (20) or have been removed from the database because the company was liquidated (11), or because of inactivity (21).<sup>42 43</sup>

A look at the liquidated companies supports the idea of shell companies. These 11 companies have a legal life of 18 months on average, and on average send 10 shipments of gold during the 6 years under review. They report having sent over US\$ 81 million.

For example, GIB Representaciones was registered in September of 2017 and sent all of its three shipments between May and June of 2018, only to be liquidated three months later, in September. During its short existence, it sent 2.3 million USD. On its part, Comercializadora LEO was legally established on April of 2016 and it sent 13 shipments between September and December of 2017

<sup>41</sup> SUNAT, the Peruvian tax agency, allows online access to basic information of all tax-paying entities in the country.

<sup>42</sup> When a company stops updating information as required by law, it is removed from the database directly by the tax administration agency.

<sup>43</sup> Since the search can only be done by name, it was not possible to link the data on exporting companies to the information included in the tax database, in 34 of the 247 cases.

worth 5 million USD; it was then liquidated in July of 2018. Another example is Contratistas Generales KBL, which came to life in August 2016 and was inactive for over a year until October of 2017. Then, during three months, it sent 8.5 million USD in 15 shipments, and was liquidated in June 2017.

A look at companies removed from the registry for lack of activity, shows similar patterns. Although these firms tend to live longer, the concentration of shipments in very short spans of time and their subsequent inactivity is a clear trend.

Bushi Gold Export was created in September of 2016 and sent 2.4 million USD between November and December of the same year. It showed no activity until October 2019 when it was dropped from the database. Another example is AHL Consultoria, which was created in March of 2016 but it did not operate until January 2018, when it sent 3.8 million USD. Three months later, by April of the same year, it had sent a total of 12.9 million USD. It did not report any other activity and was removed from the system in August 2019. The largest in magnitude is Mercanti Wayra, which was registered in December 2016, but it did not send its first kilogram until July of 2017 when it sent US\$3.5 million. Five months later, in December of the same year, it sent its last shipment worth half a million dollars. During these short five months, this company sent 18.8 million USD.

Suspended companies show similar trade dynamics, and although are still legally existing, the concentration of shipments during very short periods of time, aligns with the trends of those liquidated and officially removed from the registry. For example, Minera Xiomel, whose primary economic activity according to its tax registry is furniture manufacturing, was established in March of 2015, but sent 1.8 million USD worth of gold between July 1<sup>st</sup> and July 10<sup>th</sup> of 2020. Along the same lines, Empresa Minera Denilson, registered as a book editing company that also deals with real estate, was created in September 2018 and sent 21 shipments worth 9.5 million USD in six weeks between April 22 and June 5<sup>th</sup> of 2020.

Together, suspended, liquidated, and removed companies, traded gold for a total of 230 million USD between 2016 and 2021. Having access to US data would allow to identify US companies buying from these short-lived firms, a pattern that contradicts the stable and two-way trade relationships that usually emerge between buyers and sellers and described in the previous sections.

## v. Concluding Remarks and Recommendations

The extent of environmental crimes has significantly increased over the past few decades posing a critical challenge to the sustainability of life on earth. The study of the essence of this challenge and the concurrent design of potential responses, has traditionally focused on the upstream supply chain (i.e., from production to export) of illegally extracted raw materials affecting the environment. Consequently, a lot of knowledge has been produced on the severe effects of illegal mining on the environment, how this illegal activity is linked to human rights violations, about how it is enabled by corruption and weak state capacity, and how it promotes other forms of crime and funds international terrorism.

Without ignoring traditional perspectives, this study aims to bring attention to the downstream supply chain of gold, which links international buyers to final consumers and is the key driver of the expansion of global markets, both licit and illicit. At the stages of the downstream supply chain, the focus of the analysis of illicit economies is no longer set on the illicit nature of the mineral, but shifts towards the illegal flows of money through its trade. This is so, because at this point, gold with illegal origins has already been laundered and introduced into the international trade system. These illicit flows of money

are—to a large extent— what allows the proceeds of crime to be laundered and reinvested, allowing organized criminals to flourish, reproduce and expand infinitely. An efficient response to the challenge posed by environmental degradation from illegal extraction of natural resources, needs to address the entire supply chain, from extraction to final consumption.

Since gold is not intrinsically illegal and is incredibly sought after, it is a great vehicle to launder money. Given its physical and commercial features, it is very easy to conceal its illegal origins and very difficult to monitor its chain of custody. Enhancing transparency along its supply chain is key for the detection of crimes throughout its trade.

In this context, data analysis has proven to be an effective tool to produce supply chain intelligence and address illicit flows of money taking through the international trade system. This document is testament of that fact. It provides substantive evidence of potential cases of trade-based money laundering, and other illegal activities, such as smuggling and fraud, identifying the firms involved in these activities. With that, it provides law enforcement agencies with entry points for further analysis, investigations and potential judicial action, all contributing to the disruption of illegal activities.

In this context, maintaining updated and accurate information of trade flows, as well as securing access to such data, becomes a key element in the fight against illicit economies and the organized crime groups that manage them. Given the serious degradation that illegal gold trade and the adjacent illicit financial flows are causing the Amazon region and the opacity it generates, the US government could consider amending existing legislation to provide access to shipping manifests and other trade data from aircraft trade in addition to maritime vessel.

In this sense, the US government could also expand existing legislation so that all firms trading in gold—not just publicly listed companies in conflict-affected and high-risk regions— would have to report on their commercial activities.

As shown throughout the document, the lack of harmony in the way governments around the world report the information of their trade gives way to some discretionary decisions, which in turn provide opportunities to abuse the international trade system and engage in illicit financial flows. In this sense, it would be advisable, for example, to standardize packing methods, which would limit the possibility to fraudulently alter the weight of shipments and engage in illicit flows of money. Along the same lines, harmonizing the way custom agencies report on the different variables established by the harmonized trade system, would also enhance transparency and consequently, reduce the possibilities for fraud.