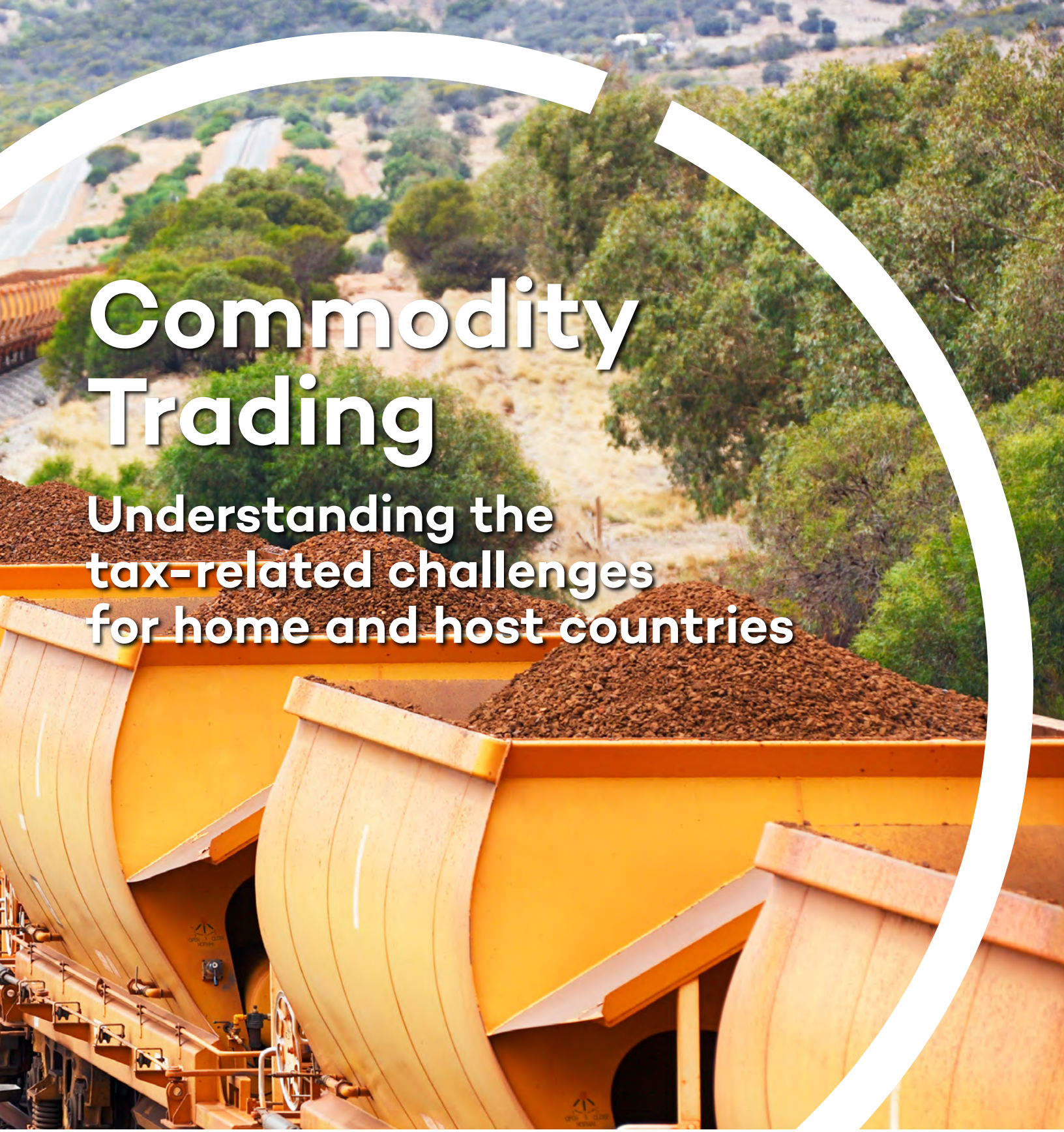

Commodity Trading

Understanding the tax-related challenges for home and host countries

IISD
International Institute for Sustainable Development

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development and Cooperation SDC

Anton Löf
Magnus Ericsson

May 2019

Published by the International Institute for Sustainable Development

International Institute for Sustainable Development

The International Institute for Sustainable Development (IISD) is an independent think tank championing sustainable solutions to 21st–century problems. Our mission is to promote human development and environmental sustainability. We do this through research, analysis and knowledge products that support sound policymaking. Our big-picture view allows us to address the root causes of some of the greatest challenges facing our planet today: ecological destruction, social exclusion, unfair laws and economic rules, a changing climate. IISD's staff of over 120 people, plus over 50 associates and 100 consultants, come from across the globe and from many disciplines. Our work affects lives in nearly 100 countries. Part scientist, part strategist—IISD delivers the knowledge to act.

IISD is registered as a charitable organization in Canada and has 501(c)(3) status in the United States. IISD receives core operating support from the Province of Manitoba and project funding from numerous governments inside and outside Canada, United Nations agencies, foundations, the private sector and individuals.

Head Office

111 Lombard Avenue, Suite 325
Winnipeg, Manitoba
Canada R3B 0T4

Tel: +1 (204) 958-7700
Website: www.iisd.org
Twitter: @IISD_news

Commodity Trading: Understanding the tax-related challenges for home and host countries

May 2019

Anton Löf, RMG Consulting
Magnus Ericsson, Luleå University of Technology.

Preface

In February 2018, the International Institute of Sustainable Development (IISD) asked RMG Consulting to submit a proposal for its participation in the project Commodity Trading: Understanding the Tax-Related Challenges for Home and Host Countries. The proposal was accepted and the project awarded. Work started in May 2018.

Terms of Reference

IISD has requested a study on how commodity traders are involved in buying and selling mineral production from private and public mining companies in resource-rich developing countries. Based on this, the study will identify any tax and financial risks associated with the transactions that have the potential to undermine government revenue collection in the host country.

Given that tax avoidance risks posed by integrated miners are better documented, priority will be given to researching other potential causes of tax loss for host countries resulting from private mineral sales to independent traders and from toll refining. The study is intended to take in the full range of tax risks posed by mineral trading, and thus is not limited to specific mineral products. It will focus on traders originating from, or based in, the major commodity trading hubs, for example, Switzerland, Singapore, London and Dubai (home countries).

The study will aim to answer the following research questions:

1. How are commodity traders involved in buying and selling mineral production from private mining companies in host countries?
2. Do these transactions create risks for host country governments? If so, what are they?
3. What effect might these tax risks have on government revenue collection in host countries?
4. How could these tax risks be addressed? What actions could home country governments take to help host country governments protect their tax base against harmful tax practices by commodity traders?

Acknowledgements

This final report has been prepared under close guidance from Alexandra Readhead, Technical Advisor, Tax and Extractive Industries at the Intergovernmental Forum on Mining and Sustainable Development (IGF), and Howard Mann, Senior International Law Advisor at IISD. We are grateful for all their suggestions and critical comments, which improved this draft report considerably.

We would also like to extend our thanks to all those who have reviewed and commented on the various versions of this report. Further, we would like to thank all the interviewees that so generously supported the making of this report. The conclusions, recommendations and any remaining errors and omissions in the report are, however, the sole responsibility of the authors.

This report has been researched and written by Anton Löf, RMG Consulting, and Magnus Ericsson, Luleå University of Technology.

RMG Consulting

RMG Consulting are policy and strategy advisors in the global mineral sector. We grew out of the Stockholm-based Raw Materials Group established in the 1970s. We provide independent advice and analysis to governments, companies, international organizations and civil society. We collaborate in an extensive network of colleagues in Europe and its mining hub in the Nordic countries and in Africa, China and Japan. We are researching and developing indices and proprietary databases on the sustainability of mining and its contribution to economic and social development as well as environmental degradation.

Anton Löf
RMG Consulting
Sweden
Phone: +46 73 643 4212
Email: anton.j.lof@gmail.com
www.rmgconsulting.org

Executive Summary

Minerals and metals are, and will remain, the material foundation for all societies. Today, many emerging economies depend on minerals and metals as important contributors to exports, gross domestic product and government earnings. Given the increasing metal intensity, when switching to a fossil-fuel-free energy supply, a nation's mineral riches are likely to provide an increasingly important route to economic and social development.

Commodity markets are global, and the trade in minerals and metals is growing. Metal- and mineral-producing countries are increasingly among the most dynamic emerging economies, while the main markets remain in the industrialized countries and China. The latter is the most important user of minerals and metals, and one of the largest importers, with import volumes still increasing.

The Role of Mineral and Metal Trading Companies

Mineral and metal trading companies are important for the smooth functioning of global markets. For certain mining companies, they are a willing, and credit supplying, buyer of their products. This is particularly true for companies from emerging economies. Trading companies are also a readily available seller to customers and end users of minerals and metals.

Trading companies act as a conduit between sellers and buyers who, for a variety of reasons, might not be able or willing to act directly in the market. It might be that these companies are too small to do so, or they do not have enough knowledge and resources, whether through a scarcity of finance, skills, experience or staff. It is estimated that trading companies handle 20–40 per cent of total international trade of some of the most important metals: iron ore, copper, nickel and zinc. For certain minor and specialty metals, their market shares might be even higher.

Mineral and metal trading companies are risk-taking middlemen creating links between buyer and seller. In such a role, they represent an additional cost, in theory reducing profits for both buyer and seller and potentially lowering the taxes paid in their respective countries. However, in many situations the trading companies offer an alternative to no trade at all or reduced volumes of metals sold.

In the long run, therefore, these companies may create additional revenue streams and increased tax payments compared with a situation where production of a mineral or metal is reduced or perhaps cannot even get started. Also, in recent years, mineral and metal trading companies have taken on an increasingly important role as providers of finance to mining companies.

Mineral and metal trading companies, to a large extent, build their activities and business on a detailed and up-to-date understanding of the markets in which they operate. They can concentrate on trade and market developments, in contrast to a mining company, which has to focus on the production of the commodity. The buyer and user, on the other hand, could focus on turning the mineral/metal into useful and saleable finished goods.

A mineral and metal trading company does not need large amounts of investments in fixed assets, only sufficient working capital to pay for the metals under their control. Consequently, they are often private and traditionally not transparent in their business, which may create additional tax risks. There are some very large international commodity trading companies, but most are small enterprises comprising a few partners with the necessary skills. In principle they can operate out of any country offering favourable legal and conditions.

Commodity trading companies are more willing to take risks than companies with big fixed investments that are responsible to large shareholder groups, such as is the position of most mining companies. The market knowledge that the metal trading companies acquire while dealing with physical transactions and with customers (both sellers and buyers) can be, and often is, used for speculation purposes.

Tax Risks Created by Mineral and Metal Trading Companies

The tax risks that mineral and metal trading companies create through their existence and their approach to business are predominantly in relation to profit-based fiscal instruments and, hence, by definition, are difficult to deal with. At the same time, it is clear that the tax risks created by mineral and metal trading companies for host country governments are in principle not different from the risks created by any exporter/importer of minerals and metals. These tax risks are well known and dealt with in international tax expert forums.

The slightly different behaviour of mineral and metal trading companies, in particular their not-so-transparent ways of operating and their risk willingness, probably slightly increase the tax risk to home and host countries alike, but they are not materially different. The use of mineral and metal trading companies does not create any particularly serious additional or specific tax risks compared with mineral and metal trading undertaken by other companies. It follows that the effect on government revenue collection in host countries is likely to be marginal.

Transfer pricing is a key risk in deals between parties that are not at arm's length. As most mineral and metal trading companies do not own mines (with Glencore being an important exception), vertical integration is limited. Therefore, transfer pricing is not a major issue in this study.

How Could Tax Risks be Addressed?

There is no panacea to solve or counter these tax risks. There are, however, some well-known ways of reducing the risks of negative tax impacts for both host and home countries alike, as follows.

Improved market information and data

Ensure access to up-to-date information about the current market situation for each commodity concerned, as well as general knowledge about demand and supply developments, including an understanding of the structure of the market and present trends. For example, what are the prices being paid in arm's length deals? Further details are important, such as knowledge of the type of contracts and conditions applied, payment terms, shipping conditions (as summarized in International Commercial

Terms [Incoterms]), premiums or reductions offered, among others. This knowledge will make it easier to judge if the terms of a specific trade are in line with general market practices.

Improved information about each trade transaction

Access to details of each specific trade, such as contracts, are obviously necessary. Particularly important are details about the true parties to the trade. Is it an arm's length deal or are the parties in some way related, and hence are there reasons to believe that the price is set to avoid tax in some way? Are there financial agreements between the buyer and the seller, and are those in line with prevailing market practices?

Improved information and data on mineral production and trade

Access to independently verified data on volumes, qualities shipped, shipping dates, payment dates, flows of payment streams and others.

Revised policies, legislation and regulations

A tax system and regulations should be introduced that are dependent on objectively verifiable data such as the volume shipped and quality of the product (grade and other similar data) and not dependent on the cost of production, shipping or other cost items (which cannot be controlled or can be only with great effort). Value calculations for tax purposes should be based on established market prices and practices and defined in detail in order to be transparent for both the entity to be taxed and the tax authority.

The opportunities for corrupt behaviour by both countries and companies are reduced by subscribing to the Extractive Industries Transparency Initiative or similar international agreements. International human rights legislation and covenants as an avenue to combat tax risks should be studied and tested if found useful.

Mineral and metal trading companies have been given an increasingly important role as suppliers of finance to the mining sector, particularly after the global financial crisis, when many banks withdrew from mining finance. Banks that fund the activities could become a major pressure group vis-à-vis the mineral and metal trading companies, as shareholder groups are lacking in many trading companies. Government and civil society increasing regulatory demands on banks that finance trading companies could strongly and indirectly influence the commodity trading companies to become more transparent, and regulatory demands could present fewer tax risks.

In recent years, growing public pressure has encouraged some home governments to adopt more strict legislation concerning illicit financial flows and corruption. Continued public pressure from business, industry and civil society organizations could, in the long run, help to decrease tax risks and other problems in the mineral and metal trading sector.

Table of Contents

List of Tables

List of Figures

Acronyms and Abbreviations

EITI	Extractive Industries Transparency Initiative
EOI	Exchange of Information
ICMM	International Council on Mining and Metals
IISD	International Institute of Sustainable Development
Incoterms	International Commercial Terms
LBMA	London Bullion Market
LME	London Metal Exchange
MCI-W	Mining Contribution Index – Wider
NRGI	Natural Resource Governance Institute
OECD	Organisation for Economic Co-operation and Development
OTC	over-the-counter
USGS	United States Geological Survey

1.0 Introduction

> No other subject within the scope of international political economy can approach the importance of trade in its effect on the lives of people as both producers and consumers; and yet no other subject has been so neglected in serious academic writing.
>
> —Cheryl Payer (1975, p. vii)

Some 40 years after Payer wrote this about commodity trading, Longchamp and Perrot added that "academic research on commodity trading is scarce. … Not only is scientific analysis lacking, but that basic, independent data on commodity trading is missing" (2017, p. 10). The interviews performed for this study confirmed that the commodity trading sector is largely secretive and unknown. There is little research available on trading companies, especially in the mineral and metal sectors—a situation that largely persists. Without solid basic facts about number of companies, traded commodities and revenues, it is difficult to arrive at more than a preliminary understanding and rough estimate of tax risks and how to address them for either host countries (where the mines are located) or home countries (where the trading company is incorporated or has a tax base).

1.1 Scope of the Study

The scope of the study narrows the field of potential commodity trading companies to those dealing with non-fuel minerals (all minerals and metals excluding fuel minerals, i.e., hydrocarbon oil/gas and coal) but not agricultural commodities. Commodity trading companies dealing only in agricultural commodities and oil and gas are thus excluded. Most of the major commodity trading companies are trading in both oil and gas and minerals and metals. The primary focus of this study is on their activities in minerals and metals. Sale of mineral and metal products by privately held mining companies to independent trading companies and the tax risks created in such trade form the narrow focus set by the terms of reference. Transfer pricing in trade between related parties is hence not covered in this study.

During our work, we have noticed that the activities carried out by mineral and metal trading companies and their role in global mineral and metal markets are generally not well known. The report hence starts by setting out in some detail the environment within which the trading companies work and what tools they use. The report discusses the roles and functions of mineral and metal trading companies and the business models they apply. Particular focus is put on the financing and operational activities of these companies. The present development trends within the sector, both in geographical terms and changes to the business model, are further explored. This sets a proper basis for how to understand both the potential positive impacts on a country's economic and social development options and potential tax risks associated with mining and commodity trading. The general starting point in this study is that it should be possible to deal with the negatives so often associated with mining—be they environmental degradation, macro-economic problems or tax avoidance—and that mining, as an important lever for social and economic development, is possible and feasible for many mineral-rich countries.[1] It is outside

[1] The push toward a fossil-fuel-free economy gives minerals and metals a key role and makes mining even more important for all countries with and without mineral resources.

the scope of the study to go into details of possible new tax systems to deal with the tax risks identified. We have, however, identified some areas that need further study by tax specialists.

The study does not presuppose any in-depth knowledge of the global mining industry and trade. Those who already know the mining sector can turn directly to Section 3, An Introduction to Commodity Trading, without reading the Background section, which presents some key facts about world mining relevant to the understanding of commodity trading and mineral and metal trading companies.

1.2 Method

The research has been divided into two stages. First, an initial phase of literature review was followed by the scope of work agreed upon with the International Institute of Sustainable Development. Next, a second phase of semi-structured interviews followed with persons with experience in metal trading. Over 50 interviews were conducted with persons from 24 countries. It has not been possible to gather much quantitative data, neither from the interviews nor from other publicly available sources. Many trading companies are privately held and, even if listed, they severely limit access to data and information. The interviews were made anonymously and with the proviso that no details of any specific companies or interviewees were to be identifiable. It was necessary for us to agree to such conditions to be able to undertake almost all of the interviews. The interviews were used as the most important source of information in writing this report.

1.3 Structure of the Report

The report starts with an introduction to the global mining industry: the size of production and exports in value and volume terms; the geographical location of mining; the most important minerals and metals; and the contribution of mining to national economies. Additional details on iron ore and gold industries are given as examples of the economically most important metals. In the following sections, we define central concepts such as *primary commodity and commodity trading company*. A brief description of the commodity exchanges and an introduction to various ways of trading in minerals and metals, including various financial instruments, show the environment in which trading companies are active. Details of price setting, contracts and the role of currencies in metal trading supplement the picture.

The report goes on to describe in some detail the roles, functions and business models applied by metal and mineral trading companies. We put a particular focus on the financing and operational activities of mineral and metal trading companies. We discuss present development trends within the sector both in geographical terms and changes to the business model.

The report concludes with a discussion of the potential tax risks related to the business model of commodity trading companies. The effects on government revenue collection are presented. Finally, a number of actions possible to combat these risks for both home and host countries are outlined and discussed.

2.0 Background

Minerals and metals are necessary for economic and social development in all countries, regardless of the stage of economic development. Mining, minerals and metals are particularly important to emerging economies, both as a source of income for government and as input to build infrastructure of all types to provide basic consumer goods such as vehicles, refrigerators and other appliances. In the near future, the necessity to shift to fossil-fuel-free energy will increase the demand for minerals and metals considerably (World Bank, 2017). There is also a legal aspect of natural resources, including minerals and metals, that is increasingly being highlighted and appreciated: "Natural resources belong to the people as a matter of international human rights. The plundering of natural resources, even when permitted by local laws, violates international human rights covenants that supersede national laws. This is why natural resource management is a legal concern as well as an economic and political one" (Gylfason, 2018, p. 33).

These overarching legal aspects of the activities of commodity trading companies (and mining companies) are only marginally touched upon in this study.[2]

A growing share of mining takes place in developing countries, while a major part of demand for minerals and metals originates in China and in the industrialized countries. In order to understand the role of metal trading companies and the potential tax risks their activities create, it is necessary to present some basic facts about the mineral and metal markets, including which are the important minerals and metals, where they are produced and the key steps from mining to refining. We elaborate with some additional details for iron ore and gold.

2.1 Supply and Demand for Minerals and Metals

2.1.1 Metal Value Chain

The main stages in the value chain from mine to metal, the main products traded and the location of these stages are:

- Mining, run-of-mine or extracted ore, done at the mine.
- Processing, for example copper or iron ore concentrates, mainly done at the mine.
- Smelting, for example blister copper/pig iron/gold doré, done at the mine or at a smelter in a different location.
- Refining, electrolytic copper/gold bar/steel, refined metal, done mainly in the country where the product is used.

Products from all these stages are considered as primary commodities and included in this study. The focus is on activities between the mine and a buyer, and thus the study focuses on the first two types of products: ores and concentrates.

[2] See Section 6.4.3, Strengthening the Legal Framework for Commodity Trading.

2.1.2 Mineral and Metal Supply

The location of global mineral supply around 2015 is shown in Figure 1. Mineral and metal production is increasingly coming from countries south of the equator and from emerging economies grouped mainly around the Pacific Ocean. In 2016, the total global value of mineral production including coal was around USD 1,000 billion. Coal accounted for roughly half of that amount (Ericsson & Löf, 2017). Global metal mine production is dominated in value and volume terms by three elements: iron ore, gold and copper. These three metals are roughly equal in value and together account for some USD 300 billion to USD 350 billion. This represents almost two thirds of the total value of production of all non-fuel minerals at the mine stage (i.e., before smelting and refining; see Figure 2). The volumes of production, however, differ significantly, from iron ore at 2,000 million tonnes (Mt), to copper concentrates at 50 Mt and gold at less than 3,000 tonnes (t).

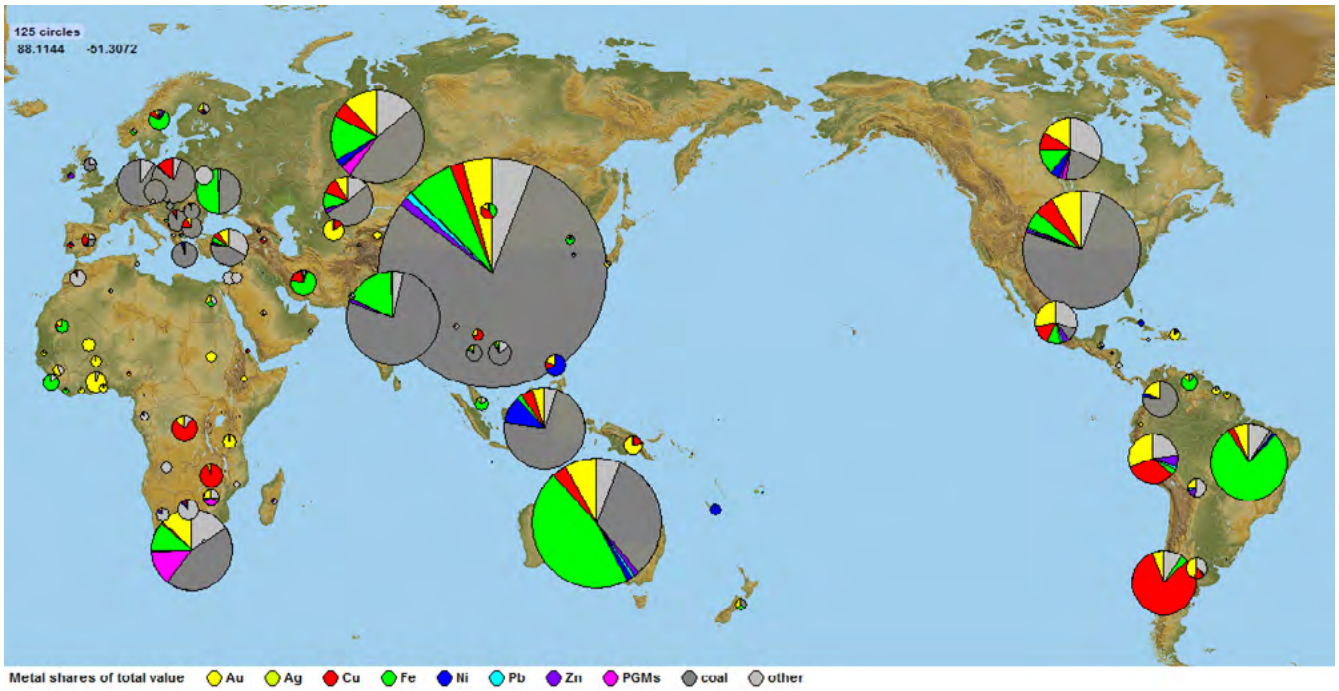

Figure 1. Value of mineral and metal production at the mine stage by country (2015)

Note: Au (gold), Ag (silver), Cu (copper), Fe (iron), Ni (nickel), Pb (lead), Zn (zinc) and PGMs (platinum group metals).
Source: Raw Materials Data (n.d.)

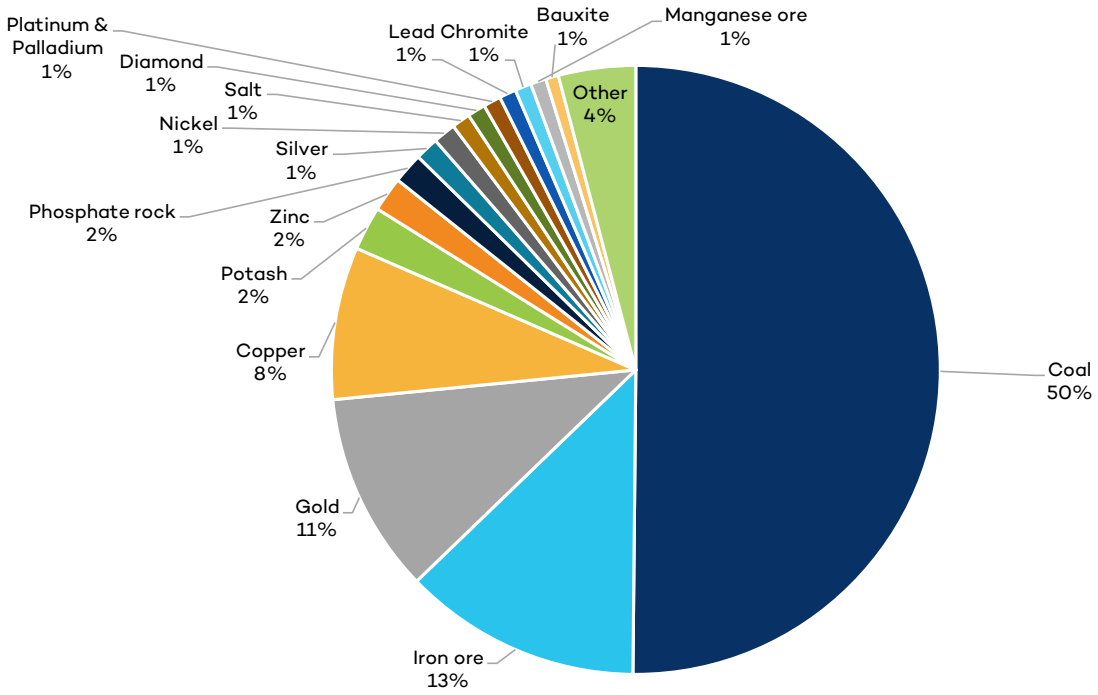

Figure 2. Total value at the mine stage by mineral/metal in 2016 (%)

Source: RMG Consulting, 2018.[3]

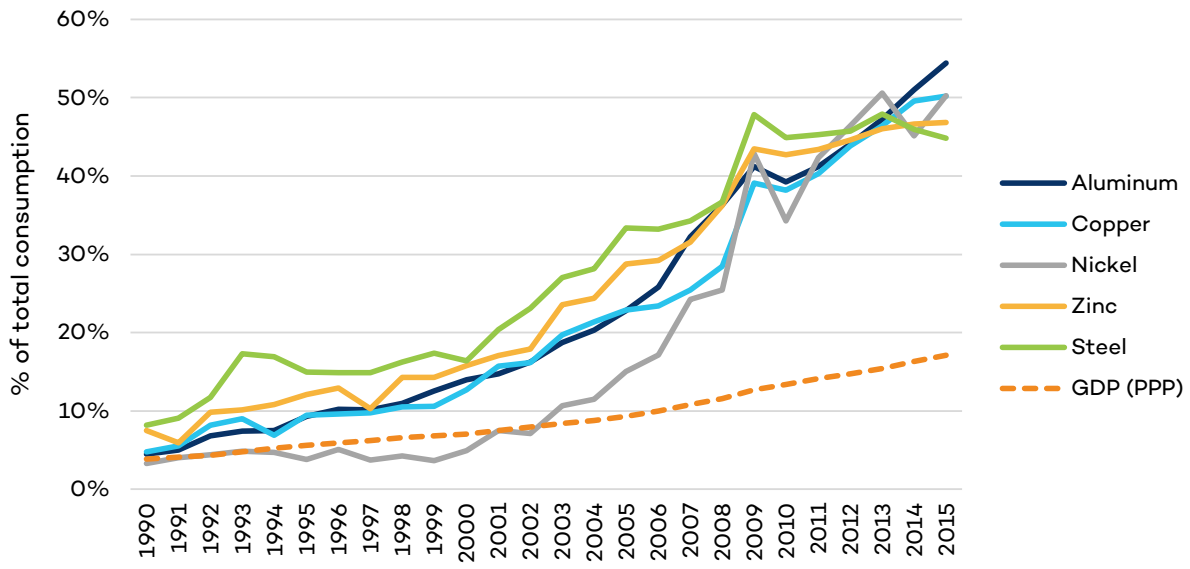

Figure 3. China's share of world demand for metals 1990–2015 (%)

Source: Humphreys, 2017.

[3] Sources attributed to RMG Consulting (2018) come from raw data collected by RMG at the time of writing this report.

2.2 Mineral and Metal Trade

By their nature, mines have to be located where mineral deposits are found. Demand for minerals and metals is, however, dependent mainly on the level of economic development in a country. Where minerals originate is hence not necessarily and not usually where customers (industrial buyers) and users (end consumers) are found. These spatial differences generate commodity trade. During the last decades, trade in mineral commodities has increased rapidly. When very large vessels were introduced—such as Capesize ships of typically between 100,000 and 200,000 deadweight tonnage—the cost of global bulk shipping declined and global mineral commodity trade increased. The lower cost in combination with the rapid pace of industrialization was also driving the increased reliance of industrialized countries on overseas sources to cover their mineral and metal needs (Radetzki & Wårell, 2017). In 1965 global exports of mineral and metal commodities had a total value of USD 23 billion; in 2013 the value had increased to USD 732 billion.[4] In 2013 global exports of all goods amounted to USD 18.3 billion, and commodities accounted for 31.4 per cent of this. The percentage of total exported goods attributed to minerals and metals shrunk, however, from 12.4 per cent to 4.0 per cent (Radetzki & Wårell, 2017) due to the growing dominance of manufacturers in total goods traded and the sinking relative value of primary commodities. This decline was halted temporarily during the so-called super cycle in the early 2000s, when mineral and metal prices rose to unprecedented levels.

The emergence of China as a major user of minerals and metals has radically changed international trade patterns. The huge demand for minerals and metals generated by economic growth in China cannot be covered by local mine production. Historically, metal and mineral trade was focused on exports to the major end-user markets in Europe and North America; today, China and Asia dominate among importing countries.

2.2.1 What Forms of Minerals and Metals Are Traded?

Only a certain proportion of minerals is generally processed and smelted into metals within the host country of production, thus many nations are exporting metal and mineral commodities at a relatively low value-added level. The factors shaping these different patterns of trade for various minerals and metals are complex and include market situation, geology, technology, geography, history and others.

Taking steel as an example, the steel works need to be fairly close to the customer to be competitive, while an iron ore mine must be large enough to take advantage of economies of scale. In combination with the low cost of seaborne transport, this encourages exports of iron ore concentrates (see Box 1 for further info). The traded share of mine production has increased over the last decades. For example, less than a third of global iron ore production is now processed in the country where it was mined, compared to almost half 10 years ago (Östensson & Löf, 2017).

Almost all gold mines produce what is called doré ingot, which is an ingot that contains most of the gold and other precious metals present in the ore. The doré ingots are comparable to blister copper, which is the end product from the third step in the mining value chain. The processed ingots are exported

[4] Fuels constitute by far the largest share of total goods exported: 17.8 per cent (USD 3,258 billion) of all trade, which is more than half of all commodities (Radetzki & Wårell, 2017).

to be further processed in a few specialized gold refineries around the world (see Box 2 for further information).

Over two thirds of copper concentrates are processed in their region of origin (Tercero Espinoza, & Soulier, 2016). The share of copper trade globally as a concentrate is hence lower than iron ore but higher than gold.

Other minerals and metals, such as tantalum, cobalt, chromite, tin and tungsten, which are produced in smaller volumes and have more unique usages, may or may not be processed and refined in the country of origin, depending on several factors, as discussed above.

Box 1. Commodity trading companies and iron ore

In 2017 global iron ore exports reached 1,568 Mt, a marginal increase over recent years. Export of iron ore is dominated by a few global major companies. The four largest mining companies (Vale, BHP Billiton, Rio Tinto and FMG) control over 70 per cent of total seaborne trade. An increasing share of iron ore produced is exported for smelting and pig iron production overseas. In the late 1970s, only around 40 per cent of world production was exported; today, it is over 70 per cent. China is driving demand and is by far the largest importer of iron ore (see Figure 4).

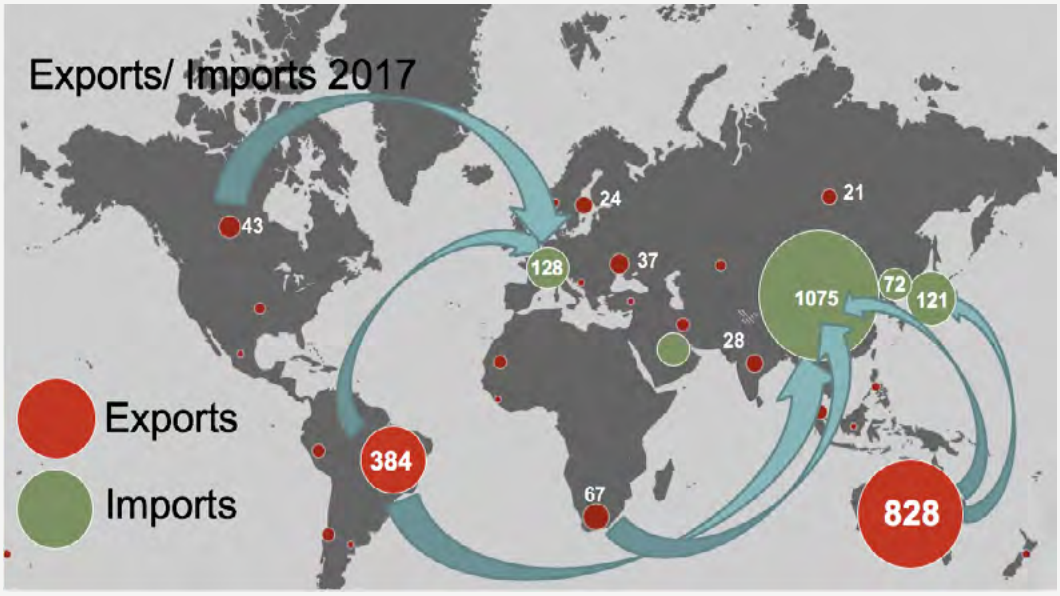

Figure 4. Iron ore trade 2017 (Mt)

Source: Löf, Ericsson, & Löf, 2018.

The iron ore market is highly competitive; many small producers have been forced to shut down since the price peak in 2011. Most iron ore, on a global level, is sold directly between the miner and steel plant, but smaller exporters can use international commodity trading companies. However, within China, the situation is somewhat different. The major iron ore producers do sell directly to big Chinese customers (steel works), but some of the imported volumes are sold to Chinese trading companies, which resell these volumes within China (see Table 1 for the largest iron ore trading companies within China). In the period of rising prices, some commodity trading companies

tried to enter the iron ore trade business, but many of them have closed down their operations in recent years. At present, around 300 Mt of iron ore, roughly 20 per cent of the total volume of iron ore traded in 2017, is handled by commodity trading companies acting also overseas. Five to six major trading companies dominate and account for around 275 Mt. Two to three Chinese trading companies have control over more than half of that volume. The remaining 25 Mt, or 10 per cent of the total volume controlled by trading companies, is handled by a couple of smaller companies.

Table 1. Major Chinese iron ore trading companies in 2014 (Mt)

	Iron ore traded 2014 (estimated in Mt)
RGL Group	120
CNBM International	60
Tewoo Group	43
China Minmetals	>40
H&C S Holding	40
Wanbao	22
Henghou Group	20
CITIC Metal	15
BM Holding	10
Shanghai Ico Minerals	9
Rizhao Zhongrui	8
Source Profit	2
Zhejiang Materials Industry Group	..

Source: Metal Bulletin, 2015.

There are several reasons for small and medium-sized mining companies to use trading companies when exporting iron ore to China:

- The trading companies can stock ores in the Chinese ports and sell in very small parcels ("by the lorry" according to one interview) up to full Capesize vessels.
- They can blend ores from various suppliers.
- They guarantee payment on time and according to contract.
- No renegotiation of contracts when signed (this can happen when dealing directly with a Chinese customer).
- They offer diversified services such as iron ore swaps between the steel mills.
- They have a wide network of offices throughout China and handle all logistics.

Sources: Löf, Ericsson, & Löf, 2018; United Nations Conference on Trade and Development, 2017.

Box 2. Gold trade

Gold production is widespread around the world (see Figure 5). China is the dominant producer at around 400 t out of a total of 3,269 t in 2017, according to the World Gold Council (2018). Many gold mines are small industrial operations that often sell to a commodity trading company. There is also artisanal production amounting to as much as an additional 20 per cent of production on top of officially recorded volumes. Virtually all of this is sold through small and sometimes medium-sized trading companies. The first link between the artisinal miners and a gold refinery is often an individual trader buying gold directly from the miners in the field.

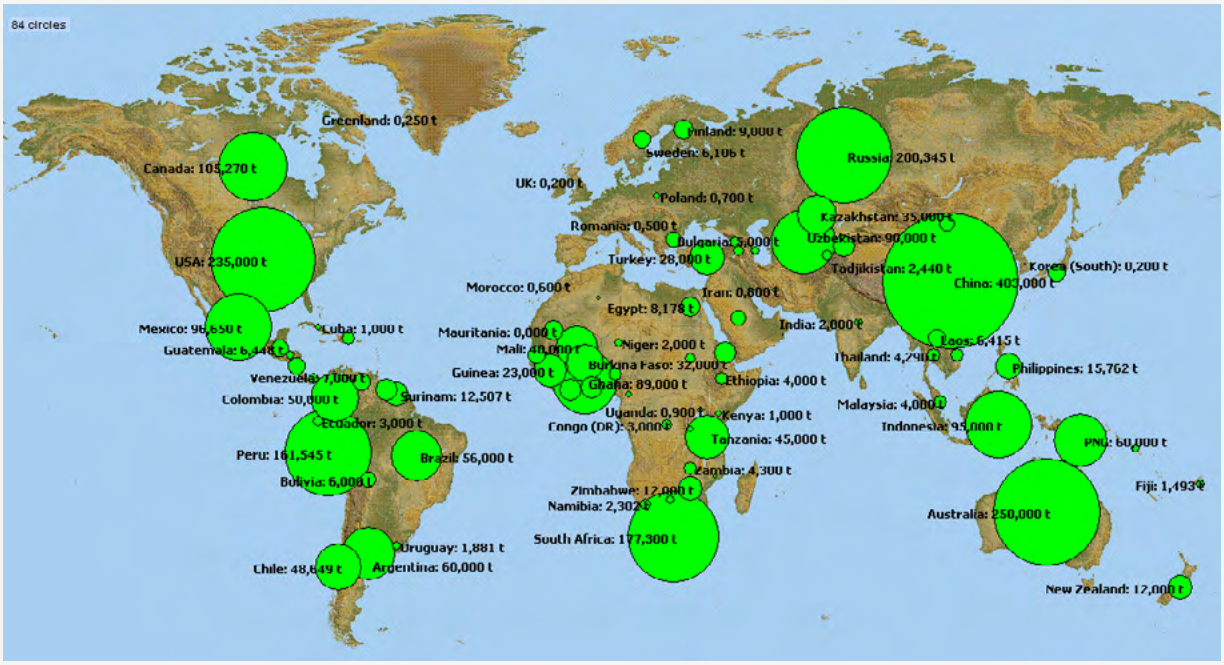

Figure 5. Gold mine production 2016 (t)

Source: Raw Materials Group, n.d.

Most mines produce either a concentrate or a doré ingot. These contain gold in a wide range of concentrations starting as low as 250 g/t. Concentrates are sold to a smelter under a common type of contract for all kinds of metal concentrates. The doré ingot will contain around 80 per cent gold and will be sold to a refinery. A trading company can be involved as a middle man in both these types of buying and selling, or the contact between the mine and refinery can be handled without an intermediary.

The major gold refineries in the world are shown in Figure 6.

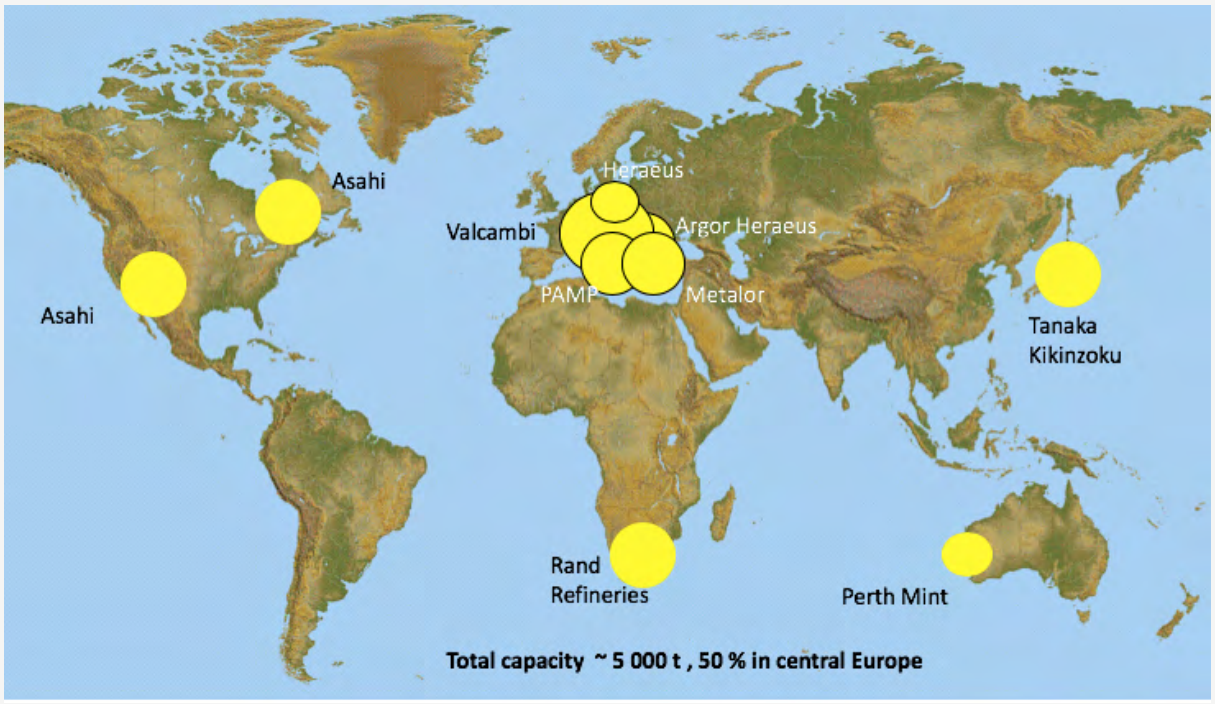

Figure 6. Major gold refineries

Source: RMG Consulting, 2018.

There are four refineries in Switzerland that have dominated the market for a long time: Metalor, Argor-Heraeus, Valcambi and PAMP. Together, they have around 50 per cent of the total world gold refining capacity. Gold refining is a low-margin business and large volumes are necessary in order to keep costs down. In recent years, the centre of gravity of the world gold industry, including demand, refining, vaulting and trading, has moved eastward, and China is becoming a major player in each step of the value chain.

A gold mining company can also maintain the ownership of the gold after refining in order to have full control over when sales are made and at what price. In such a case, the mining company must have sufficient financial resources to stock gold. Smaller or new producers might not have that capacity, but instead sell the doré to the refinery or to a trading company in order to get payment sooner.

After refining, the gold is sold to a bullion bank. There are around 35 banks around the world classified as such. They will store and deliver to jewellery and industrial customers or to central banks and other institutions that store gold for speculative or financial purposes. In most transactions, the price set at the London Bullion Market (LBMA) will be used. In some countries, such as Russia, the central bank is the only legal buyer of gold.

Sources: RMG Consulting; Radetzki & Wärell, 2017.

2.3 The Importance of Mining to National Economies

Mining contributes an important share to the national economy of many countries, in particular emerging countries. The importance of mining can be measured in many ways, including its share of exports, gross domestic product, employment, taxes, investments and the mineral rents. Many of the countries where mining makes important contributions are low- and middle-income economies. Of the 50 countries with the highest contribution of minerals to total exports, 21 had a share of minerals over 50 per cent in 2016. Around two thirds of these countries are low- and lower-middle-income economies. It is obvious that the mining sector is very important, and it is crucial to capture all the benefits it creates, in particular since mining can also bring environmental and socioeconomic problems and minerals are non-renewable resources.

The Mining Contribution Index – Wider (MCI-W) is an index that captures the contribution by the mining industry to national economies. It measures four indicators: exports of minerals, production value of minerals, mineral rents and exploration expenditure (Ericsson & Löf, 2017). Figure 7 shows the level of contribution of mining as measured by the MCI-W for individual countries.

Figure 7. MCI-W (2016)

Source: RMG Consulting, 2018.

3.0 An Introduction to Commodity Trading

This section starts with a set of definitions common to all commodity trading, which are equally applicable to mineral and metal trading.[5] A description of the commodity trading environment in general and in mineral and metal trading in particular follows. This covers both the tools used in trading and the physical infrastructure necessary.

3.1 Definitions

3.1.1 Commodities: A definition

Raw materials, primary commodities, physical commodities or, for short, simply commodities can be defined in several ways. According to the report *Commodities Demystified* by the major trading company Trafigura (2018a), "all commodities come out of the ground" (p. 8); whether agriculture, energy or minerals and metals, commodities are all "created by natural forces" (p. 8).

Some key characteristics of primary commodities and their trade are (Trafigura, 2018a, p. 9):

- They are the fundamental raw materials from which societies build and power their cities, run their transport systems, produce consumer products and feed citizens.
- They are in a raw or unprocessed state, for example ores, concentrates, smelter products and refinery products.
- They are delivered globally.
- They are generally traded in large volumes.
- They have similar chemical and physical characteristics and are exchangeable but not always standardized.
- There is no or limited premium for branded goods. Price is determined by product quality and availability.
- They can be stored for long periods.

Some secondary materials such as steel scrap and other metal scrap are widely traded in large volumes. They are included in our study.

Within the present study, the following definition is used: *A commodity is an economic good that has full or substantial fungibility: that is, the market treats instances of the good as equivalent or nearly so with no regard to who produced them.*[6] *Further, a commodity is a product of the extractive industry or agriculture.*[7] *Examples*

[5] There are several references in this section to the commodity trading company Trafigura. This company, although privately owned, has in recent years become more transparent than many of its colleagues. Trafigura has tried to become more open and has, among other measures, published a comprehensive overview of this business sector, *Commodities Demystified*, which provides a useful introduction to this area from a corporate perspective (Trafigura, 2018a).

[6] Specialty niche markets exist that exhibit significant market dynamism, even for primary commodities, with a tendency toward "horizontal" value addition and product differentiation through quality upgrading, organic certification, compliance with sustainability standards, indications of origin and branding/packaging strategies. This trend results in specialized and customized products and niche marketing that challenge the core commodity concept of "fungibility." This holds true for agriculture, but also with regard to minerals (Kimberley Process). However, this phenomenon only concerns a thin fragment of the market: the bulk of commodity trading is still in standard commodities. See Musselli (2017) for more information.

[7] Broadly intended, includes livestock, forestry, crops and fishery.

of commodities are raw materials; basic resources; and agricultural, mining and oil and gas products, such as for example iron ore, gold, oil or grains.

3.1.2 Trading of Commodities

Commodity trading is simply the purchase and sale of commodities. Commodity trading can be described as a "bilateral business bringing buyers and sellers together in over-the-counter [OTC] deals" (Trafigura, 2018a, p. 26).[8] Alternatively, it is "the intermediation between a commodity producer (a mine, or a company producing oil) and the user (a steel mill or an oil refinery)" (Longchamp & Perrot, 2017, p. 9).

3.1.3 Commodity Trading Companies: A definition

Many types of companies trade in mineral and metal commodities. Major mining companies, for example, often sell their products directly to a smelter or a refinery. Such mining companies are obviously engaged in commodity trading. Mining companies often have their own smelters and hence might also have to buy additional concentrates on top of what they get from their captive mines. Some banks are trading in commodities, mostly through various financial instruments but also, from time to time, in physical commodities.

According to Trafigura (2018a), commodity trading companies can be described as logistics companies that use financial markets to a) fund their operations and b) limit price risks acquired through their operations. Commodity trading companies transform commodities through their operations in several different ways. These activities can be described as transformations in:

- Space (transport)
- Time (storage)
- Form (blending and processing)

Transporting mineral commodities from the mine to where they are used is one of the most important functions of a commodity trading company. Commodity supply and demand are not always balanced; thus storage of raw materials might also become necessary. Commodity trading companies are sometimes involved in blending operations, either because the commodity trading company needs to aggregate small lots of material, concentrates and ores from different suppliers into economic parcels or to make sure the product meets the chemical and physical specifications demanded by the customer. Many commodities undergo some processing before they can be sold and used. For example, steel scrap is sorted, shredded and sometimes refined, and petroleum products are processed in a refinery. Some commodity trading companies are involved in processing commodities, but in the minerals and metals sector, such activities are less often performed by commodity trading companies.

[8] OTC trading is a trade directly between two parties without the supervision of an exchange.

There are other slightly different definitions of a trading company given in the literature. In effect, these overlap to a large degree with the definition used in this study.[9] They are, however, not precise or specific enough for the present study.

In the present study, a commodity trading company is defined as:

- *A company that trades physical commodities or offers trading services to a producer/miner.*
- *A company where a dominant share of revenues comes from trading in commodities not produced by the company itself.*
- *A company where most of the traded goods are primary commodities or metal containing scrap.*

With this definition, mining companies themselves are excluded, as are banks. The Japanese *sogo shoshas*[10] (general trading houses) are not included either. They do trade in primary minerals and metals that are not produced by themselves; however, most of their revenue is generated in business areas other than primary commodities thus their exclusion. Although it has both mining and trading components, Glencore is included since only 22 per cent of the revenue is attributed to the mining part. Companies that are only trading in financial instruments linked to the commodities (such as derivatives, options, futures, etc.) are not included.

Commodity trading companies for minerals and metals can further be divided into four major groups:

- Global companies trading in many commodities, for example Glencore and Trafigura.
- Specialized companies focusing on a few metals, such as Wogen—"exotic" metals from China.[11]
- Companies dealing mainly in secondary products (scrap) of various types, for example Stena Metall and other recycling companies.
- Companies focusing on a limited geographical area, often in combination with a specialization, for example Carbomax dealing with mainly ferroalloys servicing northern Europe.

In this study, several terms are used for a company involved in trading. A trading company is a company that trades goods; a commodity trading company is a trading company dealing in commodities; and a mineral and metal trading company is a commodity trading company trading in minerals and metals.

Further, the terms, *trading company*, *commodity trading company* and *mineral and metal trading* company are used to distinguish between the company dealing with the trade of commodities and the commodity trader, a person.

[9] Longchamp & Perrot, 2017, p. 9; NRGI, 2015, p. 2; Trafigura, 2018a; additional information taken from the unpublished *Commodity Trading: A Literature Study* done for the project Commodity Trading: Understanding the Tax-Related Challenges for Home and Host Countries.

[10] Japanese trading companies call themselves "general trading companies" and cover a wider range of goods and services than just commodities such as chemicals, consumer goods and industrial products. Nevertheless, they are also active in energy, as well as agricultural, mineral and metal commodities. They have a long history going back to late 19th century. Their business model is different from the commodity-focused trading companies. For several decades, Japanese trading companies have taken active minority equity stakes in Australian iron ore development, as but one example. Mitsubishi Corporation, Mitsui & Co, Sumitomo Corporation and the slightly smaller Sojitz Corporation are the most important ones.

[11] https://www.wogen.com

3.2 The Commodity Trading Environment

The commodity trading environment includes the tools used by commodity trading companies and the general infrastructure necessary for efficient commodity trading. Among the tools are: financial instruments used for both hedging and speculative trade; prices and currencies; various types of contracts and other legal documents that establish the framework of a specific trade deal, often based on the International Commercial Terms (Incoterms) (a series of pre-defined commercial terms generally used in the trade of commodities). The infrastructure includes both the intangibles—such as the legal and tax framework, commodity exchanges used for price setting and a market of last resort—and physical infrastructure—such as warehouses and stock yards, transport facilities, ships, railway lines, ports, etc. The following section sets out to describe and explain these tools and the infrastructure.

3.2.1 Tools of Commodity Trading Companies

3.2.1.1 Commodity Exchanges

The main function of a commodity exchange is to act as a marketplace where buyers and sellers of specific commodities can meet. Commodity exchanges offer reliable and robust price discovery mechanisms, hedging opportunities,[12] the possibility to invest in commodities and a market for physical trade. Among the established exchanges, the London Metal Exchange (LME), founded in 1877, stands out as the most important. Not only is it the oldest exchange, but considerable physical volumes are handled and many of the quoted daily prices for minerals and metals originate from trade there. Further, the LME, through a series of warehouses, acts as a market of last resort where miners can sell LME-registered products into approved warehouses. In the same way, users of metals can always cover their physical demand through the LME (LME 2018a, 2018b). See Table 2 for some of the most important global metal exchanges as well as some regional examples.

[12] A hedge is an investment to reduce the risk of adverse price movements in an asset.

Table 2. Selected mineral and metal exchanges

	Established	Metals Traded	Type	Country
Chicago Board of Trade	1848	Gold, silver		United States
New York Mercantile Exchange	1872	Aluminum, copper, gold, palladium, platinum, silver, uranium	Commodity futures exchange	United States
LME	1877	Aluminum alloy, aluminum, Nasaac, cobalt, copper, lead, molybdenum, nickel, steel rebar, steel scrap, tin, zinc	Commodity futures exchange	United Kingdom
Tokyo Commodity Exchange	1984	Metals		Japan
LBMA	1987	Gold, silver	OTC	United Kingdom
London Platinum & Palladium Market	1987	Platinum, palladium	OTC	United Kingdom
Dalian Commodity Exchange	1993	Coke, coking coal, iron ore	Commodity futures exchange	China
Shanghai Futures Exchange	1999	Aluminum, copper, gold, nickel, silver, steel, tin, zinc	Commodity futures exchange	China
Shanghai Gold Exchange	2002	Gold		China
National Commodity & Derivatives Exchange	2003	Metals		India
Dubai Gold & Commodities Exchange	2005	Gold, metals	Commodity derivatives exchange	United Arab Emirates
Iran Mercantile Exchange	2007	Ferrous, non-ferrous metals, steel, cement, coke, precious metals concentrate, gold bullion		Iran

Source: RMG Consulting, 2018.

3.2.2 Commodity Futures and Other Financial Instruments

Commodity exchanges also and perhaps more importantly offer various financial instruments that allow companies to, for example, hedge their price risk. According to estimates, some 10–15 times the volume of physical oil is handled through financial instruments, and, in 2006, the volume of nickel traded through financial instruments was 30 times the physical volumes (Berne Declaration, 2012). Thus the price formation takes place mainly based on the trade of financial instruments and not the physical trade.

Commodity futures have evolved alongside physical commodity trading to support price risk management. Futures are used to hedge against the risk of adverse price movements. For example, a mining company will only get paid after delivery; there is hence a considerable risk that prices will have moved downward, as shipping and payment terms mean that it might take months between when the product left the mine gate and payment. A metal working company wants to make sure that the cost of the metals used is properly reflected in the price of its final products, as the production process might also take months, but a price to the customer is often set for an even longer period. Commodity trading companies also lock in prices by employing futures and other financial instruments.

Commodity and currency futures and other financial instruments are important tools for a commodity trading company. These financial instruments can also be used for specualtive trade.

A commodity future is a contractual agreement to trade a defined commodity on a listed exchange. The quantity, quality, delivery location and delivery date are all specified in the contract. Under the terms of the contract, the seller is required to deliver the specified physical commodity on the delivery date.

A futures trade occurs when a buyer and seller agree to buy and sell a specific commodity at a certain date in the future at a specified price. The exchange acts as the counterparty for both buyer and seller, so every futures trade generates two transactions: a long position for the buyer and a short position for the seller.

The possibility of physical delivery imposes an important price discipline on futures markets. It ensures that the price of the commodity future and that of the underlying physical commodity converge as the delivery date approaches. However, physical delivery against futures contracts almost never happens in practice. Instead, sellers close out their positions by buying back the equivalent number of contracts at the exchange on or before the delivery date.

There are also other financial instruments; the most important are listed in Table 3.

Table 3. Financial instruments used in commodity trading

Derivatives	Derivatives are "derived" securities, whose price or value is determined by a "base value," for example a share price, interest rate or even the price of a commodity. Some derivatives are traded on the exchanges in standardized form and subject to certain rules. Others, so-called OTC derivatives, are exchanged directly between specialized trading parties. Not listed on an exchange, derivatives trading such as this is highly opaque.
Commodity futures	Paper trading in commodities usually involves commodity futures—a subcategory of what are collectively known as derivatives. A futures contract is a security whose owner undertakes to sell goods of a specified quantity and quality at a later date to a customer who in turn undertakes to pay for the goods at a price fixed in advance (i.e.,for a "fixed" date). There are two types of futures: binding (the goods must be traded) and conditional (the goods can be traded on the fixed date).
Standardized commodity future	An exchange-traded, binding futures contract. This type of contract is based on a real base value (e.g., copper concentrate) and includes a specific, agreed volume (quantity) and quality of goods and a fixed date and price. Yet, less than 3 per cent of the contracts agreed on the futures markets actually involve a delivery of the goods; the majority are "settled," (i.e. the difference between the initial futures price and the price actually valid on the future date is paid).
Commodity forward	Similar to a future but not standardized and therefore not traded on an exchange; instead, the contract is concluded directly between the two parties.
Traded option	An exchange-traded, standardized contract. An option is the right to purchase a commodity (e.g., copper concentrate) at an agreed price on a given date. The owner of the option decides unilaterally whether to exercise the option or not. Here too, the vast majority do not trigger a physical delivery but are settled financially.
OTC option	Not listed on an exchange, this type of option is concluded directly between two parties.

Source: Berne Declaration, 2012; RMG Consulting, 2018.

3.2.2.1 Commodity Sales Contracts

A sales contract usually sets out the terms and conditions of a sale, including the agreed volumes, leaving the basic price for each delivery under the contract linked to the spot price prevailing at the time of that delivery. Sales contracts for specific volumes may be signed for only one year or they may be for longer periods. Longer-term contracts generally include scope for varying the volume around an agreed level. A user of a commodity, for example, generally wants to be able to reduce their purchases in times of low demand of their own products. Sellers of commodities may also want to retain a certain control of their product, limiting the possibilities for resale of their product by their customer to, for example, commodity trading companies or into LME warehouses. Much metal is traded under "evergreen" contracts, often a loose agreement to do business. These contracts may set very broad bands around contractual tonnages, leaving the precise amounts to be negotiated annually. An important part of most contracts is a section protecting the buyer and the seller against unforeseen disruptions through "force majeure" and arbitration clauses.

Selling and buying under contract gives both producers/sellers and buyers/users some advantages. Miners get an assurance that they can sell all that they expect to produce, and sometimes at a price higher than the spot price. In times of high demand, however, it might tie producers to less advantageous terms than can be obtained in the spot market. For the user of the commodity, a long-term contract guarantees supplies under the contract, but not always at the best available terms when markets are weak. A term contract works both ways and gives a certain degree of stability and predictability, which is important in a capital-intensive, long-term business such as mining and smelting.

3.2.3 Price Setting in Contracts

Most contracts reference LME prices as the basis for a sales price. However, LME prices are for metal at the warehouse gate, before any duty payable and before delivery charges of any type.

A metal lot sold by an individual producer/miner/refinery is of a known quality, and it is available when and where the buyer requires. Mining companies will get a premium over the basic LME price at least equal to all costs to deliver the physical metal out of an LME warehouse. These premiums naturally fluctuate with the supply and demand balance and are an important part of the sales contract. Premiums often vary from one region to another depending on incongruent economic cycles.

3.2.4 Currencies in Contracts

In a trade transaction involving a commodity trading company, there are three parties (a mining company, a commodity trading company and a company that uses the product) who each have their "own" currency for a profit and loss calculation and balance sheet. Further, there will be two contracts: one for the purchase (between mining company and commodity trading company) and one sales contract (between commodity trading company and the user, such as a smelter). Both contracts will have several elements where currencies are involved, for example: the price of the commodity (often USD but can be other currencies as well); premiums/deductions, often in the same currency as the price, but they can also be linked to the mining company's or smelter's own currency; and invoicing currency, defined by the contract. In entering a trading deal, there is thus a risk related to currency. This is linked to movements in currencies relative to other currencies used by the trading parties for their bookkeeping. Sometimes commodity trading companies actively relieve the other parties from this risk through contracts using the mining company's or smelter's currency. Through taking on this risk commodity, trading companies will expect compensation.

3.2.5 Ownership of Product

Ownership of a commodity in a sale by normal trade changes from producer to buyer when the cargo crosses the perimeter of the ship (as per the definition of "free on board" in Incoterms 2010 rules [International Chamber of Commerce, 2010]). However, there are any number of alternatives to the base case depending on specific demands by buyer and/or seller. Each contract is negotiated and the power relation between buyer and seller (size of companies, length of relation, financial situation, etc.) always sets the limits of the outcome of the negotiations. For instance, one junior mining company interviewed was to sell its product on the stockpile. That is, the mine was to sell the product to the commodity trading

company immediately after production, and the commodity trading company would stockpile it at the mine while waiting for a ship to be able to transport the product to a user. This deal was negotiated as a way to achieve operating capital for the mine. Hence, as soon as payment was received, the product would change ownership.

3.2.6 Incoterms

Incoterms are a series of pre-defined commercial terms published by the International Chamber of Commerce relating to international commercial law. They are widely used in international trade. Incoterms help traders avoid costly misunderstandings by clarifying the tasks, costs and risks involved in the delivery of goods from sellers to buyers. Incoterms rules are accepted by governments, legal authorities and practitioners worldwide for the interpretation of most commonly used terms in international trade. As such, they are regularly incorporated into sales contracts worldwide. First published in 1936, the latest version, Incoterms 2010, came into effect on January 1, 2011 (International Chamber of Commerce, 2010).

3.2.7 Legal Infrastructure

Sales contracts define which law governs the execution of a contract. It may be the country law of the home/host country but is often a third-country law. This is because of trade practice that assumes the neutrality of both contract parties' (buyer/seller) points of view toward a third-country law. By choosing a third-country law, the jurisdiction and practices of this country will be ruling. This also means that potential legal procedures in cases where the parties cannot agree—for example, arbitration—will be defined by the third-country law. In this way, both parties reduce risks by selecting a country where legislation and procedures are well defined and known to be fair and balanced. Jurisdictions often used are Switzerland, the United Kingdom, the United States (New York) and Sweden.

3.2.7.1 Physical Infrastructure of Commodity Trading Companies

Physical infrastructure is getting increasingly important for trading companies. In order to establish a smooth logistical chain, some of the commodity trading companies invest in tangible assets such as ports, railway lines, stock yards, ships, etc. This is one increasingly important way for the trading companies to expand the services they offer to their clients. In 2018, for example, Trafigura invested USD 11.4 million in a port facility in Colombia (Trafigura, 2019). Based on the interviews, we expect this trend to continue into the future with even more engagement by trading companies in physical infrastructure.

4.0 Commodity Trading Companies

Mineral and metal trading companies are characterized in the following chapter by a number of indicators, such as geography, volumes, and types of mineral and metal trade. Further, a number of key trading companies are introduced. The emerging Chinese trading companies are also highlighted in Box 3.

4.1 Mineral and Metal Trading Companies: An overview

The *Metal & Steel Traders of the World Directory 2017* (7th ed.) (Metal Bulletin, 2017) lists more than 1,800 companies trading in minerals and metals across the globe. China is the country with the largest number of companies trading in minerals and metals (17 per cent of the total) followed by India and the United Kingdom (each 8 per cent) and Japan (7 per cent). Russia, the United States and Germany each have 5 per cent of the companies trading in minerals and metals listed. Switzerland has 3 per cent, on the same level as Italy and Turkey (see Figure 8). These figures do not, however, consider either the value of the trade performed or the size of the companies, and they give only a rough picture of the structure of the trading company world.

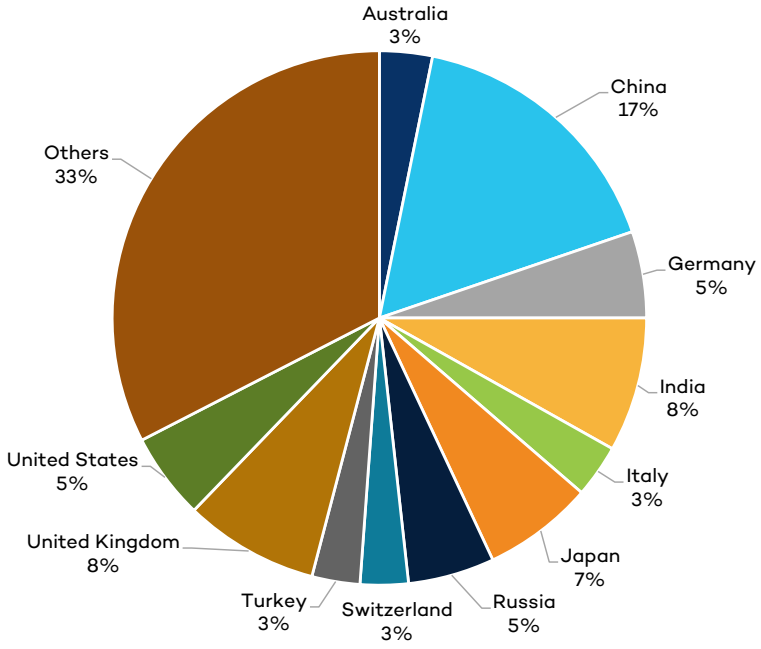

Figure 8. Metal trading companies by country 2017 (%)

Source: Authors calculations based on Metal Bulletin, 2017.

In an international survey (KPMG, 2016), 50 per cent of the trading companies that participated in the survey had their headquarters in Europe, 7.5 per cent in South America, 26.2 per cent in North America and 16.3 per cent in Asia Pacific.

In a mapping study of the Swiss commodity industry conducted by the Institute for Human Rights and Business (2017), around 500 commodity trading companies were identified in Switzerland. 90 per cent of these were privately owned, 42 per cent employ less than 10 people and only 10 per cent employ more than 300. According to the Geneva Trading and Shipping Association, there are some 400 companies in the Lake Geneva region alone that are directly connected with commodity trading; they employ approximately 8,000 employees (Östensson, 2018). Private trade organization Lugano Commodity Trading Association lists roughly 70 companies active in the Lugano region (Swiss Federal Government, 2013a).

The lack of transparency in this sector is obvious when looking at the number of privately owned trading companies. But the large discrepancies in the presented figures are also a result of the difficulties in defining a trading company. An exact definition is not presented in any of the sources consulted. The establishment of a trading company requires little capital and a small staff, and a company can easily be wound up and restarted later depending on the metal and mineral price cycle. Thus the number of active companies depends on when the survey was undertaken.

When analyzing the form of ownership of the 1,800 companies from all around the world involved in the trade of minerals and metals listed by Metal Bulletin (2017), it is clear that many of them are either privately held (41 per cent) or owned by other companies (56 per cent); less than 5 per cent is either listed or state owned (see Figure 9). Hence, only very few of the trading companies are under any obligation to divulge much about their activities.

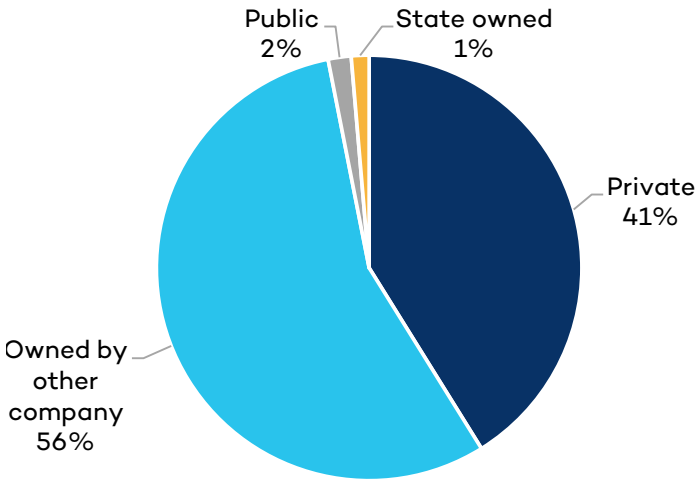

Figure 9. Type of owner to commodity trading companies, globally (%)

Note: The percentages are calculated based on the 1,259 companies that gave any information about their owners.
Source: Authors calculations based on Metal Bulletin, 2017.

In a study by KPMG (2016) covering around 80 commodity trading companies, the respondents estimated the trading activities by sector. Energy commodities dominated the trading activities of the respondents (52 per cent), minerals and metals was the second most important sector (22 per cent), followed by agricultural produce and livestock (17 per cent) and the remaining other (9 per cent) (see Figure 10). Glencore shows similar orders of magnitude for their revenue by sector: energy at 58 per cent, metals at 36 per cent and agriculture at 6 per cent (Glencore, 2018). The comparable figures for Trafigura's full year 2017 revenue are: 69 per cent energy, 31 per cent minerals and metals (Trafigura, 2018b).

It is reasonable to assume that the total commodity trading sector is divided into more or less the same proportions.

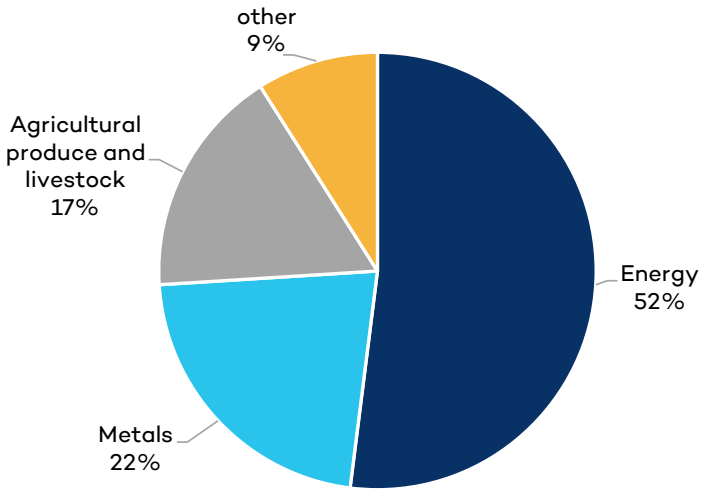

Figure 10. Trading activities by sector 2015 (%)

Source: KPMG, 2016.

In the same KPMG (2016) study covering all commodities, roughly a third of the companies had an annual global revenue of less than USD 5 billion, with an additional 16 per cent between USD 5 billion and USD 20 billion; 24 per cent between USD 20 billion and USD 100 billion; and 27 per cent over USD 100 billion (see Figure 11). These figures demonstrate that there are many small firms in the sector.

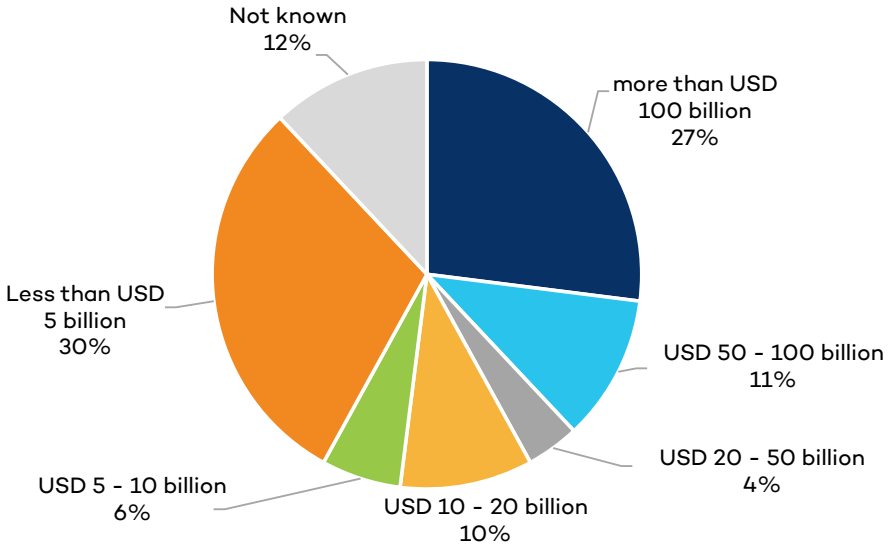

Figure 11. Commodity trading companies by global revenue 2015 (%)

Source: KPMG, 2016.

4.2 Volumes of Trade Handled by Trading Companies

There is not much data available on corporate trading patterns. For reasons of confidentiality, no trade or other public statistics contain data and information that is considered commercially sensitive or that could be traced back to a specific company. Hence, none of the sources used for this report contain any data on how much is traded by whom to whom, where companies source their material, or details on where they sell it, etc. If any such data is found, it is anecdotal and/or selective.

A report by the Swiss Federal Government (2013a) presented an estimate of the importance of Switzerland as a base for metal trading companies. The report cites figures from within the trading community stating that 60 per cent of global trade in metals and 35 per cent of crude oil are made from Switzerland (see figures 12 and 13). According to the Swiss Federal Department of Finance (2013b), the total commodity trade managed by commodity trading companies located in Switzerland is between one quarter and one third. Berne Declaration (2014) argues that a conservative number would be 20 per cent.

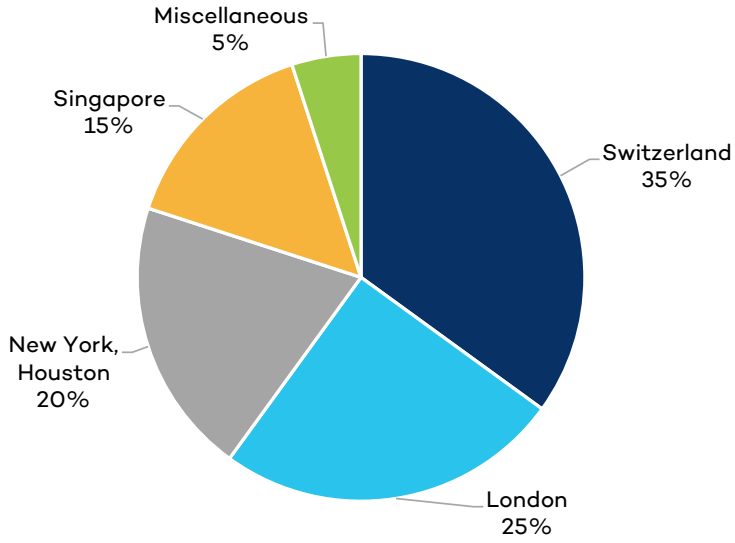

Figure 12. Market share of various trading centres – crude oil (%)

Source: Swiss Federal Government, 2013a.

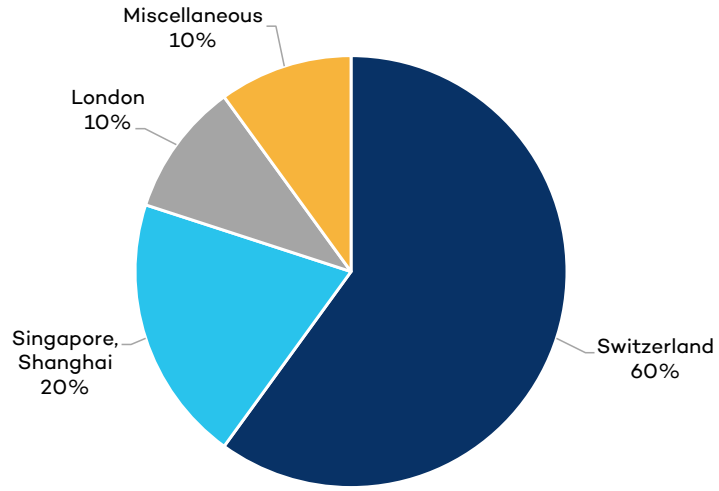

Figure 13. Market share of various trading centres – metals (%)

Source: Swiss Federal Government, 2013a.

None of the commodity trading companies provides any details on their trading activities. Glencore, for example, does not reveal to where they ship their products. They disclose revenue by region (see figures 14 and 15); however, these figures include all business activities. Further, revenue by geographical destination is based on the country of incorporation of the sales counterparty, which may not necessarily be the country of final destination of the actual product.

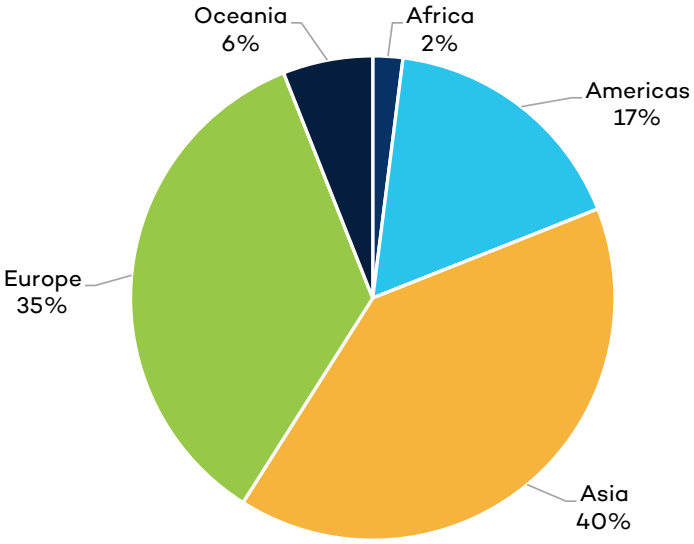

Figure 14. Glencore revenue by region 2017 (%)

Source: Glencore, 2018.

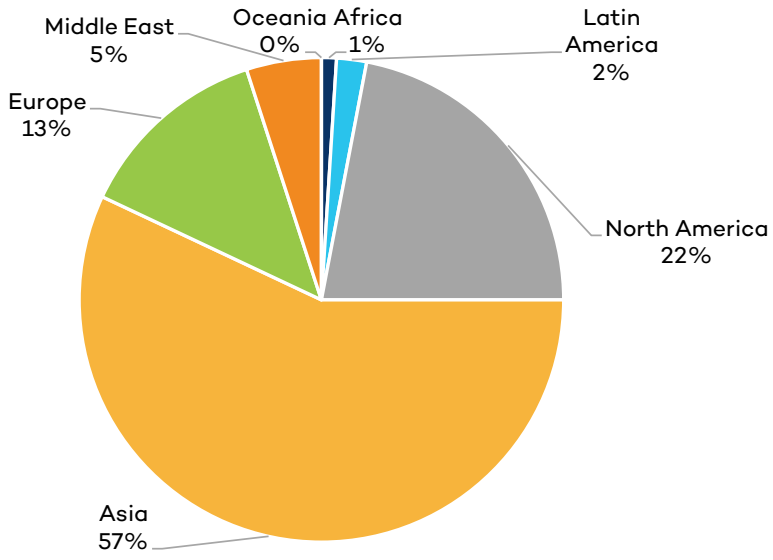

Figure 15. Trafigura revenue by region 2017 (%)

Source: Trafigura, 2018b.

In the case of iron ore, around 300 Mt is traded by commodity trading companies, which is about 20 per cent of total iron ore traded internationally. Most of these volumes are shipped to China. For copper, nickel and zinc see Table 4.

Table 4. Share of global metal concentrate exports handled by commodity trading companies 2017 (%)

	Iron ore	Copper	Nickel	Zinc
Trading companies' share of total exports	20%	30%	20%	40%

Source: Interviews and authors' estimates.

The different levels of involvement by commodity trading companies in the various metals have historical roots and are also dependent on the structure of each metal industry. Nickel has traditionally been a relatively concentrated and highly integrated business with less room for trading companies. In zinc, where Glencore is the most important mine producer (controlling 8.3 per cent of global production), the level of activity by trading companies is higher. In copper, the role of trading companies is somewhere in between these two extremes.

For a detailed description of the volumes handled by Glencore, Trafigura, Gunvor and Vitol, see Table 5.

Table 5. Mineral and metal volumes traded by Glencore, Trafigura, Gunvor and Vitol in 2017

	Glencore		Trafigura		Gunvor		Vitol		Total world	
	Volumes sold (2017)	Share of world production (%)	Volumes sold (2017)	Share of world production (%)	Volumes sold (2017)	Share of world production (%)	Volumes sold (2017)	Share of world production (%)	Production (3)	Exports (4)
Copper (kt)	4,000 (1)	20%	-	-	-	-	-	-	19,700	23,273
Zinc (kt)	2,800 (1)	21%	-	-	-	-	-	-	13,200	9,617
Lead (kt)	1,000 (1)	21%	-	-	-	-	-	-	4,700	2,516
Nickel (kt)	204.0	10%	-	-	-	-	-	-	2,100	43,231
Gold (t)	56.7	2%	-	-	-	-	-	-	3,150	..
Silver (t)	2 526	10%	-	-	-	-	-	-	25,000	453,763 (5)
Cobalt (kt)	42.0	38%	-	-	-	-	-	-	110	..
Ferrochrome (kt)	..	..	-	-	-	-	-	-	..	..
Platinum (koz)	..	..	-	-	-	-	-	-	..	..
Palladium (koz)	..	..	-	-	-	-	-	-	..	..
Rhodium (koz)	..	..	-	-	-	-	-	-	..	..
Vanadium pentoxide (mlb)	..	..	-	-	-	-	-	-	..	..

	Glencore		Trafigura		Gunvor		Vitol		Total world	
	Volumes sold (2017)	Share of world production (%)	Volumes sold (2017)	Share of world production (%)	Volumes sold (2017)	Share of world production (%)	Volumes sold (2017)	Share of world production (%)	Production (3)	Exports (4)
Iron ore (Mt)	47.7	2%	8.1	0%					2,400	1,459
Coal (Mt)	109.2	1%	46.4	0%	7.4	0%	16 (e)	0%	7,388	973 (6)
Alumina/aluminum (Mt)	10.7	8%	-	-	-	-	..	..	130	38 (7)
Non-ferrous metal concentrate (Mt)	n/a	n/a	7.9	na	-	-	-	-	n/a	n/a
Non-ferrous refined metals (Mt)	n/a	n/a	7.4	na	-	-	-	-	n/a	n/a
Thermal coal (Mt)	106.3 (2)	..	..	..	-	-	-	-	..	..
Metallurgical coal (Mt)	2.3 (2)	..	..	..	-	-	-	-	..	..

Notes: 1) Estimated metal unit contained, 2) included under coal, 3) United States Geological Survey (USGS), 4) UN Comtrade, 5) Silver ore and concentrate, 6) Coal whether or not pulverized but not agglomerated, 7) Alumina
.. = not known, - = no production, n/a = not applicable, e = estimated.
Sources: Glencore, 2018; Trfigura, 2018b; Gunvor, 2018; Vitol, 2018; UN Comtrade, n.d.; USGS, 2018.

4.3 Mineral and Metal Trading Companies

The major commodity trading companies are true global giants. Glencore, for example, employs 146,000 people in 90 offices in 50 countries (Glencore, 2018). Trafigura employs 3,935 people (Trafigura, 2018b), and Mercuria has more than 1,000 employees in 38 offices in 27 countries (Mercuria, 2018). Most commodity trading companies, however, are small with more regional coverage focusing on certain commodities, often speciality metals (e.g., Carbomax in ferroalloys) or "exotic" metals (e.g., Wogen) or secondary products (scrap) and intermediary products (e.g., Stena Metall in Sweden trading steel and other scrap).

Most of the commodity trading companies are privately held and, hence, they are subject to limited legal and regulatory pressure to publish economic and other results and figures. Among the larger commodity trading companies within the minerals and metals sphere, Glencore and Noble Group are public companies. They are the exceptions to the rule. Table 6 presents some of the larger mineral and metal trading companies by revenue, as well as a few examples of other smaller and niche mineral and metal trading companies, all discussed in the report.

Table 6. Selected commodity trading companies (2017)

Company	Revenue (2017)	Commodities traded	Corporate status	Registered in (country)	Main office location (country)
Glencore	USD 205 billion	Metals & minerals, oil & gas, agricultural	Public	Jersey	Switzerland
Vitol	USD 181 billion	Oil & gas, metals & minerals	Private	Holland	Switzerland
Trafigura	USD 136 billion	Oil & gas, metals & minerals	Private	Singapore	Switzerland
Cargill	USD 110 billion	Oil & gas, agricultural, metals	Private	United States	United States
Mercuria	USD 104 billion	Oil & gas, metals, agricultural	Private	Switzerland	Switzerland
Mitsubishi Corporation	USD 75 billion*	Coal, iron ore, base metals, precious metals	Public	Japan	Singapore
CITIC Resources Holdings Ltd **	USD 58 billion	Oil, metals, minerals, iron ore	Public	Bermuda	Hong Kong
Gunvor	USD 47 billion (2016)	Oil & gas, coal, iron ore, base metals	Private	Cyprus	Switzerland
Noble Group***	USD 46 billion (2016)	Oil & gas, coal, metals	Public	Bermuda	Singapore
Stena Metall	USD 2.4 billion	Metal scrap	Private	Sweden	Sweden
Carbomax	USD 1.3 billion	Ferro alloys, carbon products	Private	Sweden	Sweden
Castleton Commodities International LLC****	n/a	Oil & gas, bulk commodities, metals	Private	n/a	United States
Wogen Resources Ltd	n/a	Speciality metals from Chinas	Private	n/a	United Kingdom

Notes: Metal part of revenues; n/a = not available.
** Mitsubishi Corp. revenue (2017) related to metal trading was USD 10 billion (exchange rate 1 USD/ 100 yen).*
*** Controlled by Chinese state-owned CITIC Group Corporation.*
**** In financial distress after having defaulted on loan payments.*
***** Formerly known as Louis Dreyfus Highbridge Energy.*
Source: Carbomax, 2018; Cargill, 2018; CCI, n.d.; Gelncore, 2018; Gunvor, 2018; Mercuria, 2018; Noble, 22018; Trafigura, 2018b; Vitol, 2018; Wogen, n.d. Compiled by RMG Consulting.

4.4 The Geography of Commodity Trading Companies

A set of factors drive the geographical location of trading companies (KPMG, 2012) including:

- Investment-friendly government policies
- Strategic proximity to markets (buyer and seller)
- Good financial services infrastructure
- Attractive location for staff
- Stable tax rules favourable for the companies and the individual traders
- Network of investment protection agreements and tax treaties
- Political stability
- Well-developed legal and judicial system

Today, Switzerland and Singapore are major global hubs for commodity trading. The two countries offer a relatively advantageous environment for trading companies, considering taxes and national legislation as well as regulations. According to KPMG (2012), both countries have "actively courted this activity by setting fiscal policies and incentives that complement their existing positive attributes" (p. 7). Singapore has the additional advantage of being in a geographically central position, located between Australia, South East Asia and China. Finally, its timezone gives a window to talk to both Europe and China/ Australia at the same time during normal office hours.

A number of other locations are also attractive to trading companies, partly depending on which commodities are traded: Calgary and Houston for oil and petroleum, Amsterdam,[13] London and Hong Kong (KPMG, 2012; Berne Declaration, 2012). There is, at least so far, not much activity based in the Middle East.

London is still the most important location for price settlements for both precious and non-ferrous metals through the LME and the LBMA. Further, London is important because of its links to the financial community. However, physical sales have shifted: Shanghai is important mainly because of the Shanghai Gold Exchange, which is the largest physical gold marketplace.

In the minerals and metals sector, it is clear that trading companies have moved eastward during the last decades.[14] Part of the reason is that China has become the main importer of minerals and metals traded by commodity trading companies. Considering China's huge mineral and metal imports and the number of commodity trading companies within China, it is safe to assume that both commodity market places and commodity trading companies will continue to move eastward and that China will become more important in the years to come. Further, Southeast Asia and Oceania have become important producers and exporters of minerals and metals, adding strength to this trend.

Many of the major mining companies, particularly those producing iron ore and coal, have relocated their marketing and sales departments to Singapore, for example, Rio Tinto, BHP (previously BHP Billiton)

[13] Historically, the Netherlands has been an important trading nation based on its colonial empire, and the largest port of Europe currently presides in Rotterdam.

[14] See Radetzki and Wårell (2017) for a discussion on the historical reasons for the eastward movement of commodity trade and commodity trading companies.

and Anglo American. This has added to the attractiveness of Singapore for the mineral and metal trading companies.

Many of the commodity trading companies have their headquarters and much of their staff in Switzerland or Singapore. The company, however, is often registered in low-tax jurisdictions (examples are Jersey, Bahamas and Cyprus). Each major commodity trading company will have several local offices around the world for a local and regional presence in places such as New York, London, Geneva, Rotterdam, Amsterdam, Dubai, Singapore, Hong Kong, Houston, etc. These networks of offices increase the complexity of the geography of large commodity trading companies and darken the analysis. Figure 16 shows the location of Glencore's subsidiaries.

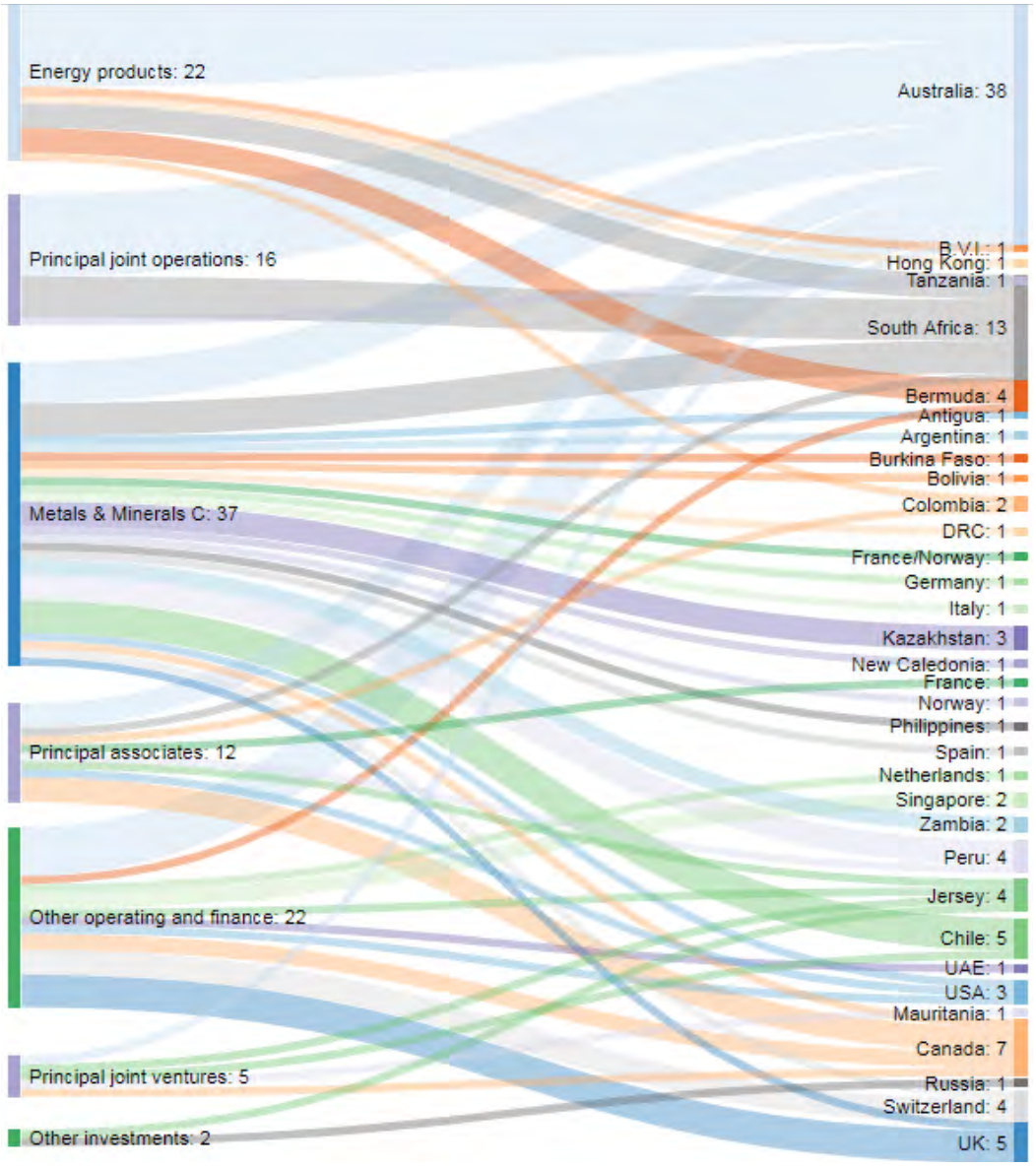

Figure 16. Home countries of Glencore's subsidiaries (2017)

Source: Glencore, 2018; RMG Consulting, 2018.

Since the early 2000s, many new mineral and metal trading companies have been established in China (see Box 3 for more information). They are mostly owned by Chinese capital and operate mainly domestically in China. In addition to these companies, there is at present a limited number of representative offices of foreign mineral and metal trading companies and mining groups. Some of the Chinese mineral and metal trading companies will most probably gradually expand their operations outside of China. From the interviews, it is clear that the international commodity trading companies based outside of China are hesitant to relocate to mainland China or establish trading offices there mainly because of complex local Chinese rules and regulations and a lack of trust in their fair application. Interviewees also mention the incident in 2009, when Chinese authorities cracked down on Rio Tinto's local China iron ore sales office as a reason for not establishing in China. The Chinese authorities claimed that bribes had been given and taken and that the office was involved in espionage. According to persons interviewed in this report, the facts and proof presented to support the accusations were not convincing.

Box 3. Chinese mineral and metal trading companies

In the *Metal Traders of the World Directory* (Metal Bulletin, 2017), there are 338 Chinese companies trading in minerals and metals listed, some 17 per cent of the total number. With the growing importance of China as an importer and user of minerals and metals, this number has been growing. A little less than half of the Chinese companies listed (230 give a start-up year) were started after 2000. Companies with less than 50 employees represent more than half of Chinese companies that give their number of staff (105 in total). (See Figure 17 for more details.) Most of these small and medium-sized companies are privately owned and were set up after economic liberalization in the 1990s. At that time, the only Chinese companies active in mineral and metal trading were state-owned enterprises such as Minmetals and Sinosteel. With the economic liberalization at that time, new types of companies were given licences to trade. Initially, end users such as state-owned and privately held steel companies were given licences; later, smaller private companies were also allowed to trade. Today, there are three types of Chinese trading companies:

1. Large state-owned enterprises with all the skills necessary, that understand the risks and have a strong financial backing. These companies form the mainstay of the mineral and metal trading business in China.
2. Smaller but still knowledgeable companies often specializing in certain minerals/metals, either state owned or private.
3. Newcomers with a weak financial situation that do not fully realize the huge risks in trading. Many are short-lived, private companies. They often take much higher risks than other Chinese companies or their European and Japanese competitors.

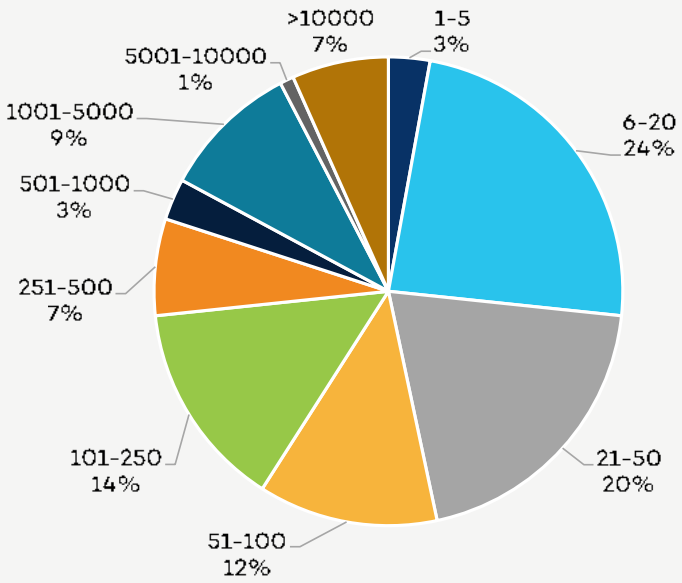

Figure 17. Trading companies in China by number of employees (%)

Note: The companies with > 500 employees are all (except for two) major producing companies with a trading arm.
Source: Authors calculations based on Metal Bulletin, 2017.

Chinese companies are active in all types of minerals and metals but represent a particularly high share of all trading companies active in beryllium, bismuth, cobalt, lithium and niobium (see Table 7). Although these figures do not take the size of the trading volumes into account, it gives an idea of the growing importance of Chinese trading companies. Given the fact that China will remain a major importer, it is highly likely that the importance of and volumes handled by Chinese trading companies will increase in the future.

According to the interviews conducted, Chinese commodity trading companies often lack the financial backing to be able to compete globally with the major commodity trading companies. Further, there is a lack of experienced and qualified staff to use the financial instruments to their fullest, which has become crucially important in the international competition among commodity trading companies. This hampers their growth at present, but no doubt they will acquire these skills and be able to access capital in the future.

Table 7. Percentage of total number of commodity trading companies that are Chinese for various metals (%)

	%
Antimony	36
Bauxite	36
Beryllium	50
Bismuth	50
Chromium	33
Cobalt	44
Copper	26
Iron ore	25
Lead	25
Lithium	43
Manganese	31
Molybdenum	24
Nickel	31
Niobium	43
Rare earths	28
Tantalum	25
Tin	24
Titanium	26
Tungsten	33
Vanadium	34
Zinc	35

Source: Authors calculations based on Metal Bulletin, 2017.

4.5 Commodity Trading Companies Moving Upstream and Downstream

Historically, commodity trading companies have simply created a link between the buyer and the seller. In many instances, there was a need for a local individual that could keep track of the many purchasers and users of the various commodities. During the last decades, this has changed fundamentally. With the introduction of the Internet, cell phones and computerized databases, buyers and sellers can in many cases, at least theoretically, find each other directly. This has forced commodity trading companies to change their business model.

As a consequence, commodity trading companies have tried to expand both upstream into mining and downstream into warehousing, refining and processing of ores and concentrates. When metal prices were high and rising, during the so-called super cycle, the risk appetite of many mineral and metal trading companies made them enter the mining industry. When prices fell again, some projects failed and the interest in investing in mining faded. The mining business is at its heart very different from trading. A mine operates according to a long-term plan over often the entire life of the mine. This plan is most often almost impossible to alter, at least without large investments. There is little room for flexibility and risk taking, as the cost of a mistake is high and can be fatal to the operation. The price of the product is set on the global metal market and there is usually no room for branding or quality premiums. In comparison, a commodity trader is expected to act quickly and seize opportunities in the market as they present themselves. From a corporate culture perspective, the combination of trading and mining is difficult given the completely different skill sets needed. Many trading companies underestimated these differences and have been forced to abandon or scale down their mining operations. Only Glencore pursues this combination strategy to the full extent. Trafigura also has some active mines in its portfolio but on a much smaller scale than Glencore.

Glencore is the exception, in that it is rightly considered both a mining and a trading company. Founded in the 1970s, it soon became the most important independent oil trading company under the leadership of Marc Rich. Rich's key insight was that oil and other raw materials could be traded with less capital and fewer assets than the big producers thought if the commodity trader were backed by bank finance. This highly leveraged business model has gone on to become the template for all modern commodity traders. In 1987 Glencore made its first acquisition in the mining industry with a U.S. aluminum smelter; a year later it bought two thirds of a Peruvian lead and zinc mine, and thus began the vertical integration within the company. Currently, Glencore owns copper mines in the Democratic Republic of the Congo; nickel mines in Australia, Canada and New Caledonia; and lead and zinc mines in Kazakhstan, Australia, Canada, Argentina, Peru and Bolivia. Most other commodity trading companies do not produce their own minerals, or they produce limited volumes. For example, Trafigura, another leading commodity trading company, only accounted for 0.027 per cent of the total value of non-fuel minerals and coal produced globally in 2014, ranking number 418, compared to 2.037 per cent for Glencore (Raw Materials Data, n.d.). See Table 8 for the metal and mineral production for Glencore, Trafigura, Gunvor, Noble Group and Vitol.

Table 8. Mine production of selected commodity trading companies 2017

	Glencore		Trafigura		Gunvor		Noble Group		Vitol		Total world
	Production (2017)	Share of world production (%)	Production (2017)	Share of world production (%)	Production (2017)	Share of world production (%)	Production (2017)	Share of world production (%)	Production (2017)	Share of world production (%)	Production (2017)
Copper production (kt)	1,310	6.6%	700 kt[1]	n/a	-	-	-	-	-	-	19,700
Zinc production (kt)	1,090	8.3%		n/a	-	-	-	-	-	-	13,200
Lead production (kt)	272.5	5.8%		n/a	-	-	-	-	-	-	4,700
Nickel production (kt)	109.1	5.2%	-	-	-	-	-	-	-	-	2,100
Gold (t)	56.7	1.8%	-	-	-	-	-	-	-	-	3,150
Silver (t)	2,526	10.1%	-	-	-	-	-	-	-	-	25,000
Cobalt (kt)	42.0	38.2%	-	-	-	-	-	-	-	-	110
Ferrochrome (kt)	1,531	..	-	-	-	-	-	-	-	-	..
Platinum (t)	3.6	1.8%	-	-	-	-	-	-	-	-	200
Palladium (t)	5.0	2.4%	-	-	-	-	-	-	-	-	210
Rhodium (kg)	404	..	-	-	-	-	-	-	-	-	..
Vanadium pentoxide (kt)	9.5	11.9%	-	-	-	-	-	-	-	-	80
Iron ore production (Mt)	-	-	0.55	0.02%	-	-	-	-	-	-	2,400
Coal production (Mt)	120.6	1.6%	11	0.15%	2.67	0.04%	-	-	0.048	0.00%	7,388
Bauxite (Mt)	-	-	-	-	-	-	0.9 (e)	0.30%	-	-	300

Note: [1]A total of 700,000 tonnes of copper, zinc and lead concentrates produced. - = no production
Sources: Glencore, 2018; Gunvor, 2018; Noble, 2018; Trafigura, 2018b; USGS, 2018; Vitol, 2018.

Downstream investments present a slightly different picture (especially in oil where the commodity trading companies have always been involved in the downstream processing of the commodity). According to the interviews, some of the smaller commodity trading companies have started to invest in downstream processing of, for example, metals such as ferroalloys and other specialty metals. These trading companies buy raw products or scrap, treat them and sell them at a higher price. An example is Carbomax servicing northern Europe with ferroalloys and carbon products. This is, however, a fairly new trend and as yet is only on a limited scale.

In a survey by KPMG (2016), 39 per cent of the respondents saw potential to invest in downstream processing, making this the preferred investment outside of the core business. The major commodity trading companies have also moved downstream to some extent, but investments have mainly focused on infrastructure like ports, blending facilities and warehouses, etc. Impala, a subsidiary of Trafigura, for example, owns and operates ports, port terminals, warehouses and transport assets.

In spite of the changes that have already been made to the traditional business model of the commodity trading companies, some of the interviewees argued that, in light of potential developments in metal markets, there will be even less need for a middle man in the future. Hence, many commodity trading

companies have found it crucial to have a physical presence as a way to back their trading business. Whether this is upstream or downstream might not be that important: the fact that few mineral and metal trading companies have actually moved upstream indicates that this business area is more complicated and further from the existing business model of the commodity trading companies. It also demands much more capital than what many trading companies can muster.

5.0 The Business Model of a Commodity Trading Company

The business model of mineral and metal trading companies is described below, with a focus on their growing financial activities.

5.1 Introduction

The business model of commodity trading companies is based on identifying and acting on market inefficiencies and directing commodities to where they are most valued (Trafigura, 2018a). An arbitrage opportunity opens up when the value of a transaction is higher than the cost of making that transaction, thus creating a margin that can be realized.

A commodity trading company in a simplified model operates on three main levels:

- Structural and legal level
- Operational and deal-making level
- Administrative level

The trading company chooses a country to operate from and a legal entity within that country to suit its operations. On the *structural and legal level*, the structure of the following elements are formulated and decided:

- Legal structure and domicile
- Tax structure
- Financing of the company, whether internal or external
- Services to be offered
- Financing of suppliers and customers
- Risk control

On an *operational and deal-making level* the trading company can offer a host of services, which are valuable in particular to small and medium-sized mining companies: knowledge of potential buyers and the detailed demands of the market; warehousing and storage facilities to build a parcel suitable for trading, shipping and logistical support; improved cash flow by paying directly on delivery, handling currency risks, etc. The margins on these traditional services of a trading company are generally thin, thus volume is essential. According to estimates by commodity traders and miners interviewed, the margins are generally between 0.5 and 5 per cent of sales prices. Generally, most of the profits made by trading companies are generated at this level. If the mineral and metal trading company is big enough, they can also speculate on future price development by building stocks or selling out as quickly as possible. They can do this physically or in the futures markets or a combination of both. The main activities at this level are:

- Collecting and analyzing market information and data
- Maintaining contacts and networks
- Making deals and negotiating contracts
- Executing special services

A commodity trading company also operates on the administrative level, administering contracts: making sure that delivered volumes and qualities are equal to what is stated in the contract, monitoring payments and money flows, etc. Key activities on this level are:

- Shipping, logistics
- Administration of contracts
- Pricing
- Invoicing, payment execution
- Quality specification and control
- Other administration

The trading company can and will make money on all three levels.

The trading company should have, and often has, full understanding of all details on these levels. Commodity trading companies are speculative in their culture and are more prone to taking on future risks than mining or smelting companies and their customers usually are. If the commodity trading company has a strong view of how the market is going to move, they will trade on that belief. When a commodity market is unbalanced and pricing is volatile, commodity trading companies can increase their profits many times through speculative trading or turn a profit into a loss.

To continuously monitor a market, stay in contact with all potential buyers and sellers in a region, build relations with the key persons in mining and exporting, know the most recent developments in terms of changing demand, recognize a potential market disruption (strike, bad weather, etc.) before anybody else and then be willing to act on that information is the life blood of a metal trading company.

The role of mineral and metal trading companies differs according to which minerals and metals are traded (Crowson, 2008). Generally, bulk commodities[15] are most often traded directly between the mining company and the user, for example, a steel company or an alumina refinery on long-term contracts.

Base metals (copper, zinc, lead, nickel and aluminum) are also mainly sold on long-term contracts, often in the form of a concentrate, directly by a major mining company to smelters and refineries. A major mining company usually has the market knowledge, customer contacts, and the financial and technical resources necessary to find their customers and ensure that they get paid for their products. These mining companies do not usually need nor use commodity trading companies. They see them as an additional cost to a trade transaction that lowers the revenues of the seller. In spite of this, surplus production above

[15] Bulk commodities are shipped in large unpacked parcels; for minerals and metals, these include coal, iron ore and bauxite.

the quota of a long-term contract concluded by a large mining company is often, though not always, sold via a trading company in order to capture opportunities given by market fluctuations. The opportunity to earn additional profits by trading with commodities has also lured the major mining companies into this scene. As one of the interviewees reasoned, "If a trading company can make profits why should not we (the miner) be able to do so?" In this way, the trading companies are squeezed from both ends in their business model. However, the trading business is not as easy as it might seem, and many mining companies have tried this route and failed.

Smaller mining companies often use commodity trading companies. These small producers simply do not have the market knowledge nor the logistical and/or financial capacity to sell directly to end users. According to one interview, the Rwandan mining industry is currently composed of mines that are too small to access the international market. A local market for the specific minerals mined does not exist, thus their only chance of selling the material is through mineral and metal traders that can aggregate and blend smaller lots into tradeable economic parcels. In certain speciality metals, for example cobalt, titanium, tantalum and others, trading companies are more important than in iron ore, copper and other major commodities. The structure of these speciality metal industries, with small producers far from the final markets, limited infrastructure to facilitate shipments and no or limited trade on exchanges, thus opaque pricing, are all conducive to commodity trading companies.

5.2 Financing Activities of Trading Companies

Commodity trading companies often act as financers to the mining sector (Crowson, 2008; Trafigura, 2018a). There are three main ways of doing this:

- Financing of working capital
- Loans or equity
- Streaming and royalty agreements

Larger commodity trading companies command considerable financial resources, often much larger than many small and medium-sized mining and smelting companies. Many commodity trading companies have huge annual turnovers in spite of having a limited capital base. Nevertheless, they are able to secure short-term capital to buy and stock the commodities they need to trade. Access to capital would not be possible unless the commodity trading company can demonstrate to financial institutions the sustainability of their business model. Thus, managing financial risks is essential to the commodity trading companies, and most commodity trading companies hedge at least part of their price risk, whether in the commodity or the freight, in order to secure a profit (Trafigura, 2018a).

Commodity trading companies buy and sell commodities that often, at an aggregated level, demand capital resources far exceeding their own capacity. In order to manage this situation, a commodity trading company needs large amounts of capital from various sources. In general, this is done with loans that have the commodities traded as collateral. Commodity trading companies are thus significant short-term borrowers. Trafigura, for example, commands credit lines valued at around USD 55 billion from around

120 banks. Larger commodity trading companies typically diversify both the sources and the structure of their financing, raising capital in various regions from many lenders with a range of repayment schedules.

Practically, banks provide short-term credit facilities secured by the commodity in the form of letters of credit, which are made available to the seller. These facilities are self-liquidating in the sense that debt is repaid immediately from the proceeds of the sale of the commodity being financed.

In regions where a commodity trading company regularly does sizable trading, a pooled borrowing base can be established. The commodity trading company will then provide a detailed overview of its inventory and receivables at regular intervals, against which it negotiates a line of credit. Trafigura, for example, has one such arrangement with a number of Mexican banks, where the company buys and stores a lot of copper, lead and zinc (Trafigura, 2018a).

Sometimes a bank might prefer to have ownership of the commodity. In these cases, the commodity trading company sells the commodity to the bank and agrees to a buy-back in a certain time period. This is mostly done because banks often find it more attractive (in terms of financing) to own the commodity. Pre-payments, a particularly important part of the trading companies' services, are usually refinanced through the open market. The trading company negotiates a syndicated lending agreement with a group of international banks.

Since the financial crisis in 2008, many traditional banks have withdrawn from lending directly to the mining companies or mining projects, in particular in developing countries. However, most of the time banks are prepared to provide loans and capital indirectly into these markets through an intermediary: a commodity trading company. In this way, the role of trading companies as financers of the mining industry has become more important in recent years.

The short-term loans and credits a commodity trading company commands are sizable and often complex and demand a particular skillset, which has developed over time. This internal know-how has become one of the most important intangible assets of the trading companies. It is one that can only be acquired by large enough companies. In the present restructuring of the commodity trading business, access to finance clearly favours the large commodity trading companies and drives further consolidation of the sector.

5.2.1 Working Capital

Normally, payment for a delivery of metal/concentrate from a mine is due upon arrival and acceptance by the customer at the destination. A trading company can pay by ex mine or free on board vessel, which means earlier payment for the miner. Commodity trading companies thus pay cash even before a product has reached the final customer. This gives the mining company funds, which might be necessary to keep on producing. The trading company hence takes on the financing costs, normally for 1–2 months but sometimes longer. Some users pay for a product only when it is actually smelted or refined, whether or not it has been in the user's warehouse; in these cases, payment can take up to 6 months or longer. Sometimes the mineral and metal trading company provides more working capital than is needed to execute a specific trade, thus facilitating the long-term activity of the mining company. Providing working

capital has always been one of the most important services a commodity trading company can offer a mining company.

5.2.2 Debt/Equity

Commodity trading companies not only act as financers and lenders to cover operating expenditure, as discussed above. They sometimes also supply investment capital to cover capital expenditure when the mine, refinery, smelter, etc., is under construction, whether green field or an expansion (brown field). This can take the form of direct loans but also pre-payments of future products.

In some cases, commodity trading companies will take an equity stake in the mine/project.

5.2.3 Streaming

A metal stream (also called a metal stream deal or metal streaming) is an agreement that provides the right to purchase all or a portion of one or more of the metals produced from a mine in exchange for an upfront deposit payment, at a price determined for the life of the transaction by the purchase agreement (see Figure 18). The metal stream agreement is generally a long-term contract, often 10–12 years and sometimes for the life of the mine. Streaming deals are particularly common for precious metals produced as by-products, for example, gold and silver in a copper mine (The Platform for Collaboration on Tax, 2017).

Streaming and royalty[16] deals are usually not considered part of a mineral and metal trading company's normal portfolio but are arrangements generally performed by so-called *streaming companies* and **royalty companies**. However, in the case of streaming deals, the company de facto buys and sells the commodities and thus acts as a mineral and metal trading company.

Mining companies often take the view that the equity market does not value their by-products to their full value. This has to do with the equity market focusing on the primary product produced in a mine. In such cases, the mineral producer can sell these by-products through a metal streaming deal for cash in hand and, as an additional bonus, also get an increase in the share price.

A streaming deal provides capital that can be used for any number of purposes by the mineral producer, such as an expansion of production capacity, lowering of debt, etc. Streaming deals also have the advantage that they do not dilute the share value in comparison to financing from the equity market. For these reasons, there are many mining companies that are actively involved in streaming deals, including some of the larger miners such as Vale. It is interesting to note that, among the trading companies, which are also miners, Glencore has itself made use of external streaming deals. This underlines the point that metal streaming is:

A. Regarded by mining companies as a practical and advantageous option for raising funds, as both Vale and Glencore could probably access capital through other means.

B. Not usually performed by the mineral and metal trading companies but by streaming and royalty companies.

[16] A royalty deal is similar to a streaming deal; however, it gives the right to receive revenue-based or profit-based interest in a mining venture, thus it does not usually involve any physical commodity.

Figure 18. Metal streaming

Source: The Platform for Collaboration on Tax, 2017; Metalla, 2017.

6.0 Potential Tax Risks Related to the Business Model of Commodity Trading Companies

This chapter will discuss some of the tax risks that may flow from mineral and metal sales by privately owned mining companies to independent commodity trading companies. The main risk is that the mine is underpaid for its product. Other risks depend on the opaque nature of the trading industry sometimes involving corrupt practices, in part because of the lack of legislation and regulations demanding transparent business operations.

In order to understand the potential tax risks related to the business model of commodity trading companies and to be able to discuss them, it is necessary to have a basic understanding of the principles of taxation of the mineral industry (see Table 9) and the relationship between the trading parties, as well as within what tax jurisdictions the parties are operating.

While the mining company within the host country will naturally have a taxable presence there, a commodity trading company is most likely located outside the host country (i.e., the home country). This is, however, not a major problem, as transactions are conducted between two independent parties: the mine and the commodity trading company. This is important since it takes away one of the more difficult tax risks: the risk of abusive transfer pricing. A transfer price is the price of a transaction between two entities that are part of the same group of companies. The risk is that related-party transactions are used to shift profits from the country where the mineral resource is located to lower-tax countries as a means of reducing the group's overall tax bill. For example, a mine might sell its mineral product at below-market price to the trading arm of the parent company, which then on-sells the product at full value to a third-party customer, allowing profits to accrue offshore. The result is that host country governments are left with less profit to tax. The risk of abusive transfer pricing is not limited to sales, but can also apply to the cost of services and goods provided by related parties to the mine in the host country. It is important for the host country to establish whether or not the trade is between independent companies or not. If the trade agreement is between two independent companies, a reasonable price can be expected, as both companies, theoretically independently from each other, will each try to get the best possible price from its own point of view.

However, even if the parties trading are unrelated, there might still be risks for fraud or tax crimes through mispricing. "Mispricing in transactions between unrelated parties can and is applied regularly to virtually anything" (Baker, 2005, p. 25). According to Baker (2005), arrangements for mispricing between unrelated parties to generate foreign kickbacks are fairly simple. Two parties agree on a price but the invoice either overstates or understates the true value of the trade. The difference gets funnelled, sometimes through elaborate dummy corporations set up solely for the purpose of the deal, to low-tax countries allowing non-transparent agreements into the private bank account of whoever wanted to move the money. These tax crimes are very similar to transfer pricing but are fundamentally different; however, a more open and transparent trade does also decrease the risk for fraud.

There are other tax risks for the host country government. The interest of the mining company is to maximize profit, which should also be the interest of government, since more profits should mean more taxes. However, their interests may diverge where the mining company takes risks relating to the sale of the mineral product that ultimately reduces or defers government revenue. Overall, governments, especially cash-strapped ones, are likely to be less risk averse than private mining companies.

6.1 Mining Taxation

For a host country, several benefits from an operating mine and any related trade make up the total contribution to the national economy. These benefits come in the form of investments in infrastructure, knowledge transfer, the creation of jobs and revenue streams.

The discussion in the following sections will focus on tax risks related to the fees and taxes levied on corporations. However, it is important to acknowledge, as Johannesen and Pirttilä (2016) argue, that a domestic tax system that can collect the consumption and income taxes, which most often constitute the bulk of tax income for a country, is an important part of capturing the wealth created by a mining operation. This argument stresses the importance of making sure that the workforce employed by a mining company is taxed within the host country. It also encourages governments to focus on upgrading skills to make sure the workforce available is sought after by mining companies. This does, of course, not mean that the question related to the corporate revenue stream is less important; it simply acknowledges that company taxes are not the only revenue stream to watch for a host country. As Burgis (2015) points out, taking Africa as a whole, for every USD 6 that governments bring in from direct taxation, taxes on personal income and company profits, they bring in USD 10 from taxes on the extraction and export of resources. This really shows the importance of the taxation of the extractive sector for the African continent and developing countries.

Table 9. Main fiscal instruments in the commodities sector

Bonuses	A one-time payment made upon the finalization of a contract, the launch of activities on a project, or the achievement of certain goals laid out in the law or contracts. Sizes vary, ranging from tens of thousands to even hundreds of millions of dollars for a few large petroleum projects.
Royalties	Payments made to the government to compensate it for the right to extract (and purchase) a non-renewable natural resource. Most royalties are either ad valorem (based on a percentage of the value of output, e.g., 5 per cent of the value of the minerals produced) or per unit (based on a fixed amount, e.g., USD 10 per tonne). When examining the likely financial impact of a royalty, it is important to consider not just the percentage or per-unit value, but also the base against which that figure will be applied. The system in place for measuring the value or market price of the mineral plays an important role in determining the impact of royalty rules.

Income tax	In some cases, oil, gas and mining companies are subject to the general corporate income tax rate prevailing for all businesses in a country; in other cases, there is a special regime for these extractive sectors. Because petroleum and mining projects require heavy capital and operational investments, rules on how the tax system handles costs and deductions—the deductibility of interest payments, the depreciation of physical assets, the ability to count losses from one tax year to offset profits in a future tax year, etc.—play a major role in determining how governments and companies benefit.
Windfall profit taxes	Some countries have set up special tax instruments designed to give the government a greater share of project surpluses, through additional tax payments, when prices or profits exceed the levels necessary to attract investment.
Government equity	In some cases, petroleum and mining projects are set up as locally incorporated entities for which shares are divided between a private company and a state-owned company or another public body. Holding these equity stakes can give the state access to a portion of dividend payments.
Other taxes and fees	Additional sources of fiscal revenues for the state include withholding tax on dividends and payments made overseas, excise taxes, customs duties and land rental fees.
Production sharing	Many oil and gas contracts entitle the state to a share of the physical quantities of petroleum produced. These systems typically allocate such resources as reimbursements on production costs, then split control over the remaining "profit" oil or gas between the operating group of companies and the government. The government either sells its portion on its own or takes cash payment from the operating companies in lieu of physical delivery of the commodity.

Source: Natural Resource Governance Institute (NRGI), 2010.

Tax risks related to the main fiscal instruments can be summarized as follows:

a. Profit-based fiscal instruments: Commodity trading companies are intermediaries between a mining company and a user of that commodity. Theoretically, the introduction of an intermediary trading partner will increase costs in comparison to a producer selling directly to a user. Host countries' fiscal instruments that are dependent on the profit of a mining company, such as income tax, windfall profit tax and dividend payments from government equity, may be reduced by virtue of the mine paying a commodity trading company to sell its production.

b. Royalty: Royalties can be based on value of production, most common or volumes. In both cases the tax authority, through the Ministry of Mines or other regulatory agencies, first determines the volumes of metal contained or ore produced. Second, the way a price for the product is determined is defined by the law. Third, a way of calculating the value of the commodity produced is pre-defined for the period of taxation. The relevant royalty rate is then applied. Problems could appear in measuring the volumes and the grades of metal content. More importantly, the price to apply and how to calculate the value have to be clearly defined in the legislation. In some

legislation, the royalty calculations are made after deducting certain costs, such as the cost of using a commodity trading company. Thus, the use of a commodity trading company could in theory influence royalty payments depending on how the royalty calculations are made, hence creating a tax risk.

c. Bonuses, other taxes and fees, and production sharing: Bonuses, other taxes and fees, and production sharing are all measured and/or taxed prior to or independently from the sales and trade of the commodity. Thus, these fiscal instruments do not constitute a tax risk from the use of commodity trading companies.

6.2 Mining Companies' use of Commodity Trading Companies

Almost all mining companies interviewed state that they do not want to use commodity trading companies, as they are an unnecessary cost. However, one mining company interviewed stated that they would sell to whoever paid the most and another claimed that they often got better deals from commodity trading companies than from the actual users of the commodity. In fact, one financing company interviewed, who over the years has helped quite a few smaller mining companies set up offtake agreements through auctions, claimed that most often these auctions were won by commodity trading companies who, in effect, put in the highest bid for a specific commodity. Thus, while a tax risk for government, the use of a commodity trading company by a mining company does not automatically mean lower revenue for the mining company compared to selling the product themselves.

Many of the interviewees underline the existence of a knowledge gap between the mining company and the commodity trading company: "Miners do not know their own markets," as a commodity trader expressed himself. This could imply that the mining company gets too little for its product, both in sales to users and to commodity trading companies. As shown above, the use of a commodity trading company can increase profits for a mining company, as the commodity trading company would know the market better and thus could find a more suitable purchaser of the product that would be willing to pay a better price for the commodity. In other cases, the commodity trading company had strong views on where the market would move and was willing to pay a premium over the spot price to the mining company in order to be able to speculate on future price developments.

Nonetheless, the fact that a mining company uses a commodity trading company to sell their products is most often due to a lack of alternatives when it comes to a lack of working capital or a lack of finance during the construction of a mine. Other reasons might be that the mining company is too small, does not have enough knowledge of the market, or lacks skills and experience.

6.2.1 Sales of Mineral Production

There are four ways that a mining company may choose to sell its mineral production to a commodity trading company. The first is a sales arrangement whereby the mining company pays the commodity trading company a fee or commission to sell its product on its behalf. The second is that the commodity trading company buys the product and sells it to its own customers. The third is where the mine gives the commodity trading company the right to purchase all or some of its production at an agreed price in

return for an upfront deposit (i.e., metal streaming). The fourth is where the mine gives the commodity trading company a share of production commensurate to its equity share in the project. The choice will depend on a range of factors. The relevance for this section of the report is that each sales arrangement may have slightly different implications for host countries' tax bases.

a. A commodity trading company sells production on behalf of the mine or buys the product directly.

There are a number of independent commodity trading companies that can act as a link between producers and consumers of minerals and metals. These companies either act as brokers/marketers for mining groups, selling the production on their behalf, or as physical purchasers of minerals and metals for sale to their own customers.

In the first arrangement, the commodity trading company gets paid a fee for service or a commission. A fee for service is likely to comprise the cost of providing the service (e.g., the commodity trading company's operating expenses) plus a markup. A commission, on the other hand, is likely to be based on the value of the sale and might therefore be much higher than a fee for service (see Box 4). Any cost incurred as a result of using a commodity trading company is likely to be tax deductible, thus lowering all profit-based taxes and raising questions for the tax authority as to whether the cost is necessary and legitimate. The cost may also reduce mineral royalties, depending on how they are calculated in the host country.

Box 4. Commission example

One iron ore mining company entered into an agreement with a mineral and metal trading company to sell part of its mineral product on its behalf. In return, the trading company would keep 25 per cent of the sale price received as a commission. The agreement was made for a limited volume. While the commission appears relatively high, the agreement was made when the demand for many metal commodities had fallen in the aftermath of the 2009 financial crisis. Many miners were stuck with increasing inventories, as there were no buyers for their specific products. Some mining companies even had to temporarily close production as stockpiles grew out of the stockyards and warehouses. In this situation, the mining company in question was prepared to forgo 25 per cent of sale revenues to achieve a sale at all. However, in this specific case, it turned out that the mineral and metal trading company was also unable to make a sale, and the deal fell through.

In the second type of arrangement, the minerals and metals trading company pays the mine for its product, takes legal title to the goods and on-sells it to its own customers. From the perspective of the host country, the main risk is that the mine is paid less for its product than had it sold it directly to an end customer. Depending on how much product the commodity trading company buys, and over what period, the mine may offer discounts, thereby reducing the sale price received and, hence, the taxes. The cost may also reduce mineral royalties, depending on how they are calculated in the host country.

b. A commodity trading company acting as a financer in return for the right to buy

Commodity trading companies can act as lenders of capital when the mine and processing facilities are under construction, generally as a prepayment (see Box 5). They may also sometimes pay cash upfront in return for the option to buy a stream of the mine's future production (see Box 6). These alternative forms of financing have emerged in response to the difficulty miners have in accessing capital from traditional sources. Unlike standard financing structures, these new arrangements are less restrictive, meaning the mine retains control over its operations; and, as they are distinct from debt, the miner's broader borrowing capacity is unaffected.

Box 5. Example of prepayment

In November 2017, Glencore entered into a silver supply arrangement in exchange for an upfront advance payment of USD 675 million. Under the terms of the arrangement, Glencore is required to deliver an average of 19 million ounces of silver per annum, over a three-year period (Glencore, 2018).

By the end of 2017, the World Bank expected the average price per ounce of silver to be USD 16.92 in 2018, USD 16.84 in 2019 and USD 16.76 in 2020 (World Bank 2017). Based on this forecast, the value of the silver sold by Glencore would be USD 960 million, 42 per cent higher than what the buyers paid.

However, the actual average price for silver in 2018 (at September 25, 2018), according to the LBMA, was USD 16.13 per ounce, approximately 5 per cent lower than expected by the World Bank.

It is by no means certain that the companies used the prices quoted here as their basis for an evaluation of the deal. Nonetheless, the analysis shows that there is a risk for both the buyer and the seller in relation to prepayment. In this case, it seems the seller, Glencore, may have gotten less for the silver than had it sold on the spot market, assuming that the World Bank forecast is broadly accurate. The advantage for Glencore is that it knows exactly what it will get for its production and, hence, lowers its exposure to price risk, demand risk, etc.

Box 6. Example of a streaming deal

In 2012, Wheaton Precious Metals,[17] a metal streaming company based in Vancouver, Canada, acquired a metals stream from the Constancia copper, molybdenum, silver and gold project in Peru operated by Hudbay minerals. Specifically, it acquired 100 per cent of the future silver production. Wheaton Precious Metals paid Hudbay minerals USD 295 million prior to commercial production as financing for the mine construction. In 2013 Wheaton Precious Metals acquired a further 50 per cent of future gold production from the mine for a cost of USD 135 million. In addition, Wheaton Precious Metals agreed to a fixed price of USD 400 per ounce of gold and 5.9 USD per ounce of silver delivered to Wheaton Precious Metals over the life of the mine. By late 2013, there were 97.3 million ounces of contained silver in resources and reserves and 1.76 million ounces of contained gold in resources and reserves at the Constancia open pit and the Pampacancha satellite deposit (Wheaton Precious Metals, n.d.).

According to the World Bank (2013), in 2013 gold was expected to decline in value in the long term toward USD 1,300/oz (nominal USD), while silver was expected to decline in value toward USD 20/oz (nominal USD). The forecasted prices would place a value of the stream at USD 2.1 billion. The value of the deal would thus be 98 per cent higher than what the buyers paid for it. As in the example of the prepayment, it is highly unlikely that the companies used these figures for an evaluation of the investment, but it serves as a means to discuss the potential values of the deals. This streaming deal is, however, a much riskier investment than prepayment, from the investor point of view. The first funds paid out are to be used to finalize the mine; there is thus no producing entity when the funds are committed to the mining project. There is a further risk that all of the reserve cannot be mined for a variety of reasons or does not exist because of poor geological exploration work, etc. There will also be a loss in the processing of the ore: a certain percentage of the metal in the ore will be lost and cannot be recuperated in the processing step. In this case, this loss is between 30 and 40 per cent; however, this is accounted for in the initial calculations. Also, the investment is over several years, which in itself increases the risk for the investor. If, for argument's sake, there is a 20 per cent reduction in the reserves, the total value of the stream will be USD 1.7 billion: the investment will pay out 79 per cent more than the cost compared to the 98 per cent should all reserves be mined.

The advantage of these alternative forms of financing is that the mining company gets cash upfront, which may be necessary to bring the mine into production or fund further development. Depending on the cost of capital, these deals may be no different to sourcing a loan from a bank. In fact, according to the interviews, commodity trading companies may be willing to offer finance cheaper in exchange for exclusive rights to sell the future product.

However, there are several risks to the tax base of the host country, particularly regarding streaming agreements. These are:

1. Streaming deals typically last for the life of the mine. Consequently, any discount that the investor receives against the market price for the product will be profit to the investor, reducing the mine's taxable revenue.
2. The streaming metal is typically sold at fixed prices far below the market price, in which case the owner of the stream gets all of the benefits if market prices go up. For example, in 2011, Canadian

[17] Wheaton Precious Metals was prior to May 2017 known as Wheaton Silver.

streaming company Wheaton Precious Metals was buying silver from some mining companies at less than USD 4/oz when silver prices rose to almost USD 50. The result was a massive transfer of wealth from mining companies to the streaming company (Koven, 2015). For a host country government, this means there is significantly less profit to tax per sale than if the mining company had not sold their product via a streaming deal.

3. Streaming is based on a percentage of the mine's production. If total production over the life of mine is higher than expected, the investor will receive a windfall without any extra compensation to the producer (or government) for that benefit.

In theory, the upfront payment received by the mining company may compensate the government for the loss of tax revenue. This is provided that the government can tax the income directly and invests the additional funds in a way that increases the value more than the forfeited tax income. Another means is if the funds received by the mining company is invested in the host country, for example, in new projects or processing facilities, which could increase the value of the exported product. However, there are many ways the mining company might use the cash that will not directly benefit the government. The mining company could use the payment to improve its debt-to-equity ratio in order to remain compliant with local tax laws or improve financial ratios to boost its share price. Neither of these actions is directly related to increasing the profitability of the mine in the host country. Consequently, the trade-off for government—lower tax revenue in return for an upfront payment—requires careful monitoring by the host country.

Another potential issue is that the price of by-products (e.g., gold and silver) is often counter-cyclical compared to the main product (e.g., copper). This means that, in times of a low price for copper, the revenue from gold/silver provides a welcome cash inflow for the mine and the host country government. A streaming agreement fixes a price for the by-products, thereby removing the buffer for the mine and the government.

c. Trading companies own equity in mines – vertical integration

In recent years, some mineral and metal trading companies have expanded into mining. This means they directly own, or are part owners of, mining assets. Consequently, any transactions that take place within the group (e.g., the mine sells a portion of its production to an affiliate) should be priced as if they took place on an open market (i.e., according to the "arm's length principle"). Box 7 describes a number of related-party transactions that pose a tax risk to the host country's tax base. These risks are true for all vertically integrated extractive companies. Within the present study, as noted in the scope of work, the potential problems with transfer pricing are only briefly described and discussed.

Box 7. Examples of related-party transactions

- Mineral sales – mineral products may be sold to a related company, for example, a trading company or a smelter.
- Procurement and export of goods – a company purchases mining machinery on behalf of its subsidiary; the price charged will include the direct cost plus a fee for service.
- Financing – the subsidiary receives a loan from its parent, usually to finance its exploration or development costs. This is another way for shareholders to provide capital to a mining project, but its accounting treatment is different from equity. Loans generate interest and are repaid in priority to dividends but do not give controlling rights.
- Support services – the subsidiary pays a fee to a related party in return for a range of administrative, technical and advisory functions.

Source: Readhead, 2017b.

6.3 Tax Risks and Location of the Commodity Trading Companies

Two tax-related issues influence the geography of the sector, both of which are addressed below in more detail. These tax issues mainly concern home countries. Our research indicates that one reason of many for the eastward movement of commodity trading companies is an increased demand for transparency as well as onerous tax rules in the United States and the United Kingdom. The original intention of many of these tax rules was to make the sector more transparent. However, according to the interviewees, an unwanted side effect of these transparency and tax rules for home countries has been that some commodity trading companies, as well as commodity traders, have relocated, in particular from the United States.

A second tax issue is found in the tax practices of many large companies. As discussed earlier, many of the commodity trading companies have their headquarters and much of their staff in Singapore and Switzerland while often being registered in yet another low-tax jurisdiction. Further, the networks of offices of the major commodity trading companies increase the complexity of understanding individual trades and assessing where profits should be allocated. A commodity trader interviewed stated that, while the trade deal was de facto organized in London, all contracts were signed in Switzerland. For this specific case, a flat fee was paid to the tax authority in the United Kingdom to compensate for potential tax losses. Suffice it to say that there is certainly a tax risk for home countries in relation to establishing where a specific deal was realized among all the various tax jurisdictions of the major commodity trading companies.

6.3.1 Lack of Financial Disclosure

Commodity trading companies are typically privately owned. In 2016, among the top commodity trading houses by revenue that trade in minerals and metals, only two of the six largest are publicly listed: Glencore and Noble Group (Trafigura, 2018a). As noted earlier, private companies in most jurisdictions do not need to publish any information, thus there is limited information disclosed by trading companies. This may make it difficult for host country tax authorities to risk review transactions between local mines

and trading companies. The picture gets even more complicated in the case of larger commodity trading companies with complex corporate structures. Many of these companies are also located in low-tax jurisdictions with limited demand locally for disclosure of company data.

The lack of transparency is a fundamental problem, both for host and home countries, as governments cannot make informed assessments or decisions, nor can they evaluate risks related to commodity trading companies (EBP, 2017). In the book *Commodities – Switzerland's Most Dangerous Business* (Berne Declaration, 2012), the writers point out that:

> *The commodity industry, like the finance and banking sectors, is dominated by impenetrable structures and obscure deals. Secrecy is a part of the business model. … It is obvious that such a systematic lack of transparency will leave the gates wide open to corruption, patronage and poor management. (p. 364)*

Chêne (2016) acknowledge this and writes:

> *The sector is also notoriously opaque and poorly regulated, with low levels of transparency and accountability. Against such a backdrop, corruption is widespread, with practices ranging from bribery, money and commodity laundering, and various forms of favouritism. (p. 1)*

Illegally traded natural resources can further be traced to sponsoring other types of illicit activities, which are facilitated by corruption (Østensen & Stridsman, 2017). Corruption risks associated with trade of commodities are high mainly due to the volumes of the financial transactions, the high degree of interaction with public authorities, the opacity of both the sales themselves and the actors involved, and a lack of regulation (Longchamp & Perrot, 2017).

There are certain initiatives to increase transparency, such as the Extractive Industries Transparency Initiative (EITI). The EITI is a global standard to promote the open and accountable management of oil, gas and mineral resources. The standard seeks to address the key governance issues (EITI, 2016, 2018). The EITI standard requires information along the extractive industry value chain from the point of extraction to how the revenue makes its way through the government to how it benefits the public. This includes how licences and contracts are allocated and registered, who the beneficial owners of those operations are, the fiscal and legal arrangements, the amount produced, the amount paid, where those revenues are allocated and the contribution to the economy, including employment. Countries where these regulations have been incorporated into law include, for example, the United Kingdom and Canada.

While EITI is mainly for mining companies and governments selling commodities, the commodity trading company Trafigura has formally declared its support to the EITI. The company has committed to disclosing payments to national oil companies for crude oil and petroleum products, including gas, as well as associated corporate taxes and, where relevant, licence payments to governments. To date, only one commodity trading company, Trafigura, has published its payments of its own volition. The company's total payments to governments amounted to USD 21.2 billion in 2016. However, the data presented by Trafigura is limited to countries that are members of EITI, while 90 per cent of its payments go to other countries.

The integration of the commodity trading industry into EITI reporting in countries that implement the standard is a relatively new and evolving part of EITI implementation. The 2013 EITI standard explicitly addresses a core set of transactions undertaken by commodity trading companies; however, these are focused on trade with state-owned companies. The NRGI's work on commodity trading also stresses the importance of further transparency in the industry, though also largely in relation to state-owned enterprises.

Regulations on financial disclosure related to the extractive industry generally only consider the companies responsible for extraction. Commodity trading companies are not included. As commodity trading companies are an important part of the extractive sector value chain, it is surprising that so little effort has been made to increase the transparency of the sector.

In order to decrease risks—such as taxes and others—increased transparency is necessary. Thus, a recommendation is for home countries to require commodity trading companies to disclose more data in general and specifically the payments made to governments globally in line with models developed by, for example, EITI.[18]

6.3.2 Corporate Regulation of Trading Companies

The general culture of the commodity trading companies can create additional risks for both home and host countries. Commodity trading companies are dealers in risk: they alleviate mining companies of risk, but they also invest in risk through speculation. Any profits made from these deals will, in the best case, be taxed in the home country of the commodity trading company; in the worst case, it will not be not taxed at all or will be taxed in a country with low tax rates. This is a potential tax risk for the home country. To a large extent, mineral and metal trading companies build their activities and businesses on a detailed and up-to-date understanding of the markets in which they operate. They can concentrate on the trade and market developments. It is logical that the mineral and metal trading companies are more risk-willing than companies with big fixed investments and large shareholder groups to be responsible to.

However, there are huge risks involved. Some trading companies, such as Stemcor and Noble, have made mistakes in their analyses and are on the brink of bankruptcy. Stemcore, a steel trading company, used debt to grow during the years 2001–2005; in 2013 the company could not repay its loans, as steel prices had plummeted, and the company was restructured and debt was written off as a means to avoid liquidation. Noble Group went from revenues of USD 45.5 billion in 2016 to verging on bankruptcy in 2018 (see Box 8). In the case of Noble Group, critics have raised concerns about local regulation and follow up protocols when a company does not adhere to the rules of the exchange where the company is listed. Critics point toward both the Singapore exchange and the local government for not following up on irregular use of accounting by Noble Group (Iceberg Research, 2017).

Commodity trading companies going bankrupt have major implications for home and host country governments. Bankruptcy would result in job losses, as well as a significant reduction in tax revenue. Further, where the companies are publicly listed, shareholders may lose their investment. For the host country, the tax risks are different. There may be an interruption in mineral sales, as the buyer, the

[18] Naturally, it is also of interest that EITI and NRGI include commodity trading companies in their descriptions of the extractive industry.

mineral and metal trading company, cannot fulfill its end of the bargain. For a mining company in need of working capital, this could be detrimental to the entire operation. If a holder of a streaming arrangement goes bankrupt, the problem is not nearly as significant for the host country. The initial payment has already been received, and streaming deals are such that whatever the mining company gets per unit of sold product is so low that selling the product to another company for the same price would not be a problem. Further, most streaming arrangements are constructed in such a way that the streaming arrangement is considered an asset that the holder can resell.

The corporate culture of commodity trading companies has not only involved them in a risk vis-à-vis investments but also in regard to environmental problems and corruption. Glencore, for example, is currently under investigation by the U.S. Department of Justice on charges of bribery, corruption and money laundering in Nigeria, Venezuela and the Democratic Republic of the Congo over a decade (Hume, Sheppard, & Sanderson 2018). In addition, Marc Rich, one of the founders of Marc Rich + Co, which would become Glencore, fled the United States when indicted on tax evasion, fraud and racketeering. This is a risk not directly linked to taxes but should nonetheless not be ignored as it can be a considerable cost for tax payers.

An example of an environmental problem is the 2006 Ivory Coast illegal toxic waste dump that allegedly killed 17 and injured thousands of people. A ship registered in Panama, the Probo Koala, chartered by the shipping company Trafigura Beheer BV, a daughter company of Trafigura, paid an Ivorian waste handling company that dumped toxic waste in the port of Abidjan.[19]

There are several guidelines to support a more responsible extractive sector. The OECD Guidelines for Multinational Enterprises are recommendations addressed by governments to multinational enterprises operating in or from adhering countries (Organisation for Economic Co-operation and Development [OECD], 2011). They provide non-binding principles and standards for responsible business conduct in a global context consistent with applicable laws and internationally recognized standards. Further guidelines include the *OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas* (OECD, 2016) as well as the *OECD Due Diligence Guidance for Meaningful Stakeholder Engagement in the Extractive Sector* (OECD, 2017). The OECD guidelines are often the basis for other more commodity- or sector-focused guidelines. Other important guidelines include the International Council on Mining and Metals (ICMM) Principles. ICMM membership requires a commitment to 10 principles that serve as a best-practice framework for sustainable development in the mining and metals industry (ICMM, 2015). As with the transparency initiatives, these guidelines are mostly concerned with the extractives industry itself and not with the trading part of the extractives industry.

[19] For further information see Berne Declaration (2012).

Box 8. Noble Group

In February 2015 Noble Group was accused by Iceberg Research of overstating its assets by billions of dollars (Iceberg Research, 2015)—claims that Noble rejected. Since then, Noble Group's market value has plunged by more than 95 per cent (see Figure 19), and the profit for 2017 was reported as a loss of SDG 4.9 billion (see Figure 20).

Noble Group have, through accounting techniques, increased the overall balance sheet of the group to cover up for losses incurred—for example, through future trading contracts that far overstated the value of the commodity within the contract. Currently the company is in a reconstruction process following its inability to pay certain debts.

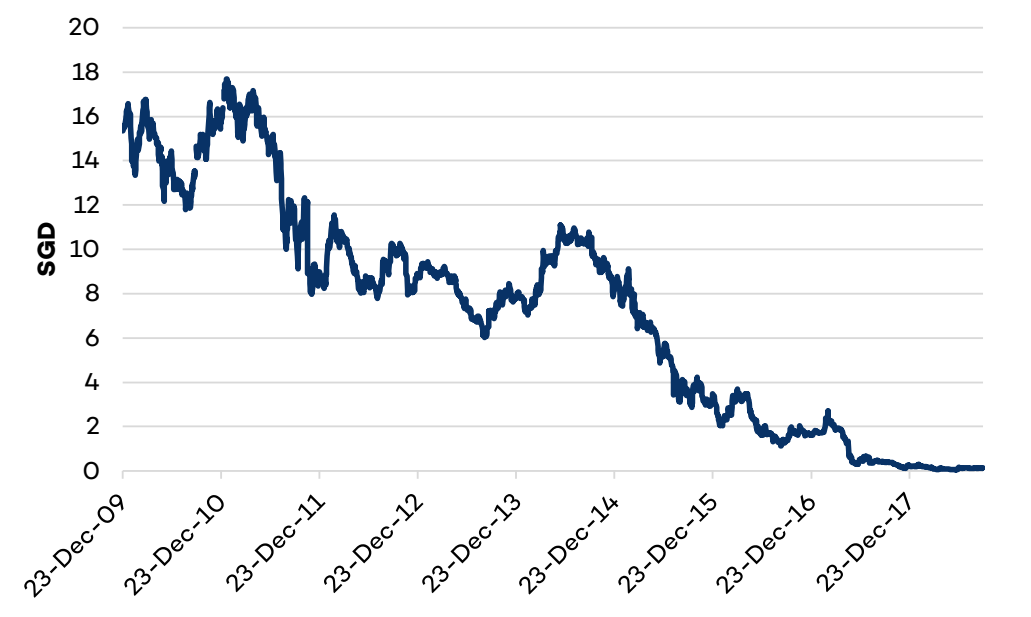

Figure 19. Noble Group share price development 2009–2018 (SGD)

Source: SG Investors.io (n.d.).

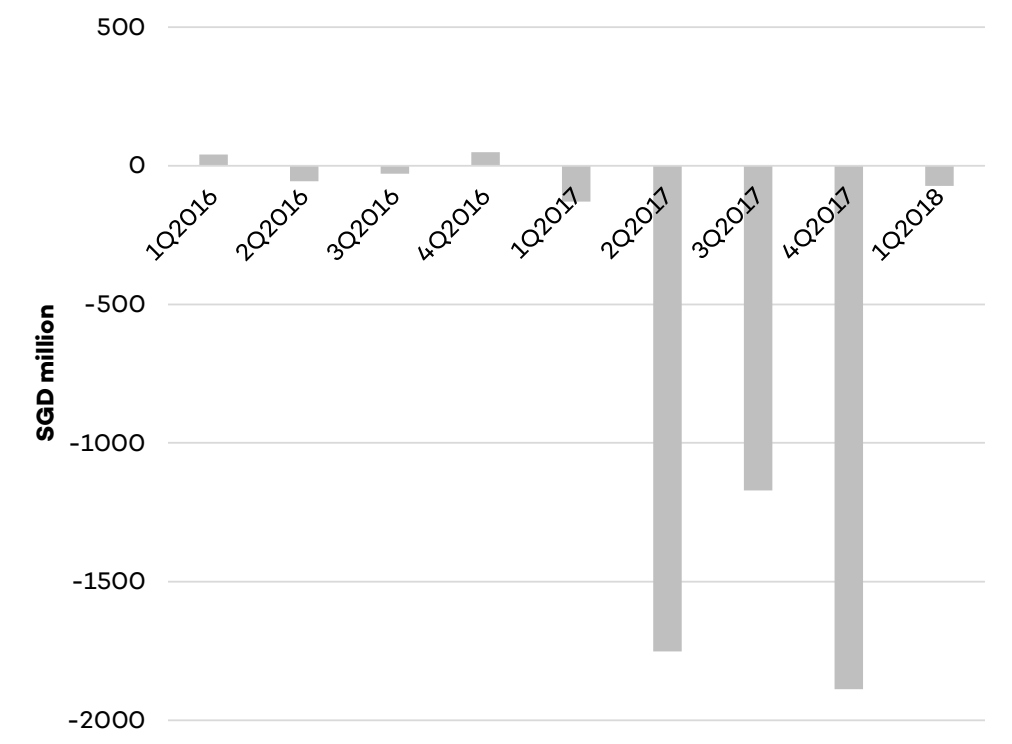

Figure 20. Noble Group quarterly profits 2016–1Q2018 (SGD)

Source: Noble Group, 2015, 2016, 2017 and 2018.

6.4 Combatting Tax Risks Arising From Commodity Trading

The following section discusses various potential actions that the host and/or home country can take to limit tax risks. The discussion is not limited to mineral and metal trading companies but is applicable to all commodity trades independent of the type of company and, for that matter, the type of commodity. It is beyond the scope of this study to go into the design details of a revised tax system. Detailed work on the taxation of the commodity industry, whether mining companies or trading companies or other companies are involved, is done by tax specialists in international forums such as the UN's Subcommittee on Extractive Industries Taxation Issues for Developing Countries.[20]

6.4.1 Understanding and Evaluating Commodity Trading Arrangements

The first issue is verifying whether the commodity trading company is related to the local mining company. If it is, the government will need to determine whether transactions between the mine and the commodity trading company are priced according to the arm's length principle (see The Platform for Collaboration on Tax [2017] for guidance). More likely than not, the commodity trading company

[20] See, for example, *United Nations Handbook on Selected Issues for Taxation of the Extractive Industries by Developing Countries* (United Nations, 2017b). This volume covers several of the areas in which we suggest further actions in more detail.

is independent, in which case transfer pricing rules will not apply. However, the government will still need to determine if the fee or commission paid to the commodity trading company is appropriate. This will depend on the service provided and the level of risk assumed by the commodity trading company. For example, marketing advice may be more appropriately rewarded by a fee for service, whereas a commodity trading company that identifies customers and arranges the sale on behalf of the mine may be entitled to a commission.

In assessing the level of remuneration, governments should consider the following factors:

- The mineral and metal trading company's level of expertise and knowledge related to marketing/trading
- Scope to influence the sale price
- Services provided (e.g., advising on market conditions or negotiating sales contracts)
- Ownership of goods (i.e., the commodity trading company taking ownership of the goods reduces the mining company's exposure to price risks, demand risks and logistics risks, presumably making this type of arrangement more valuable)
- Cost of the mine arranging sales directly, rather than going through a mineral and metal trading company

With respect to streaming agreements, the sales revenue forgone is only justified if the upfront payment is cheaper than traditional forms of borrowing. Therefore, government will need to understand the miner's rationale for entering into such a deal—the terms, as well as the cost of borrowing a comparable amount from a commercial bank. The government may also insist that certain conditions are included in the streaming agreement. Two examples include an option for the mining company to buy back production from the streamer if the agreed price turns out to be too low or a cap on the volume of the streamed product, based on the size of the mineral reserve at the time of the agreement. Thus, any increase in total production over the life of the mine will benefit the miner, and hence the government, not the owner of the stream.

Misreporting of sales volumes and the quality of the product, for example, what percentage of metal in the ore or concentrate, is an issue for host countries. Theoretically, as with transfer prices, this would not be an issue if the seller and the buyer were two independent companies both striving to get the best possible deals for themselves. However, any commodity exporting country should have a system and an infrastructure for the control and the examination of exported mineral commodities. Solutions include posting government officials to mine sites to directly monitor mineral production, as well as requiring that companies declare by-products in production reports. Determining the grade or value of the primary products and by-products (i.e., the purity of, for example, the gold or silver) will require analytical testing. Whether the testing is done directly by government or outsourced to a private firm is a policy choice.

One of the most important institutions related to the control and examination of exported goods is the customs authority of the host country. Capacity building in this area is fundamental for the efficient and correct handling of export commodities. However, because the customs authority deals with all import and export goods, a special unit, entity or institution within or outside of an existing institution might

be more appropriate—an institution with the mandate to grant commodity export rights to companies only after all details of the contract, including physical details of volume and quality, are controlled and verified. Such an institution should work in close cooperation with, for example, tax authorities, customs authorities, the Mining Ministry and the Ministry of Trade, whether or not a part of any of these institutions.

In cases when a commodity trading company acts as a financer of a new mining project, interest will be charged; however, they are to be paid. The risk of these interest rates being much higher than should be expected, thus increasing the cost of mining and consequently lowering the taxable profit, is always present. In order for a tax authority to manage these tax risks, a clear understanding of international interest rates charged for similar projects are of interest. Such detailed knowledge is unfortunately hard to get, as each mining project is unique. Interviewees from major and junior companies as well as commodity trading companies and banks argue the question in the opposite direction: that an interest rate is the cost of funds for a specific project. If the mining project in question could have gotten a better interest rate from anyone else, the company running the mining project would have chosen that lender instead. Such a view has its logic; however, if such a view should be adopted, it is crucial for the host country to make sure that the parties are independent from each other.

What complicates the matter is that a long-term contract signed during a certain period in the commodity cycle might be reasonable, while the same deal signed in other times would be questionable. It is important to understand the environment in which a contract between a mining company and a commodity trading company was signed to be able to identify whether the specific deal is reasonable or not.

6.4.2 Potential Support for Host Country Governments

In some home countries, the government and governmental institutions will be familiar with the business of commodity trading. This is because commodity trading companies and traders have a physical presence in some countries where trading hubs are located. In order to enhance the ability of host country governments to identify and mitigate tax risks associated with trading, home governments in the countries where trading takes place and trading hubs are located could provide targeted capacity building on the business of commodity trading. The aim would be to help tax administrators and customs to better understand how commodity trading works, including the commercial drivers, the different business models, corporate structures and tax arrangements.

Governments in home countries could also be amenable to pressure to introduce more detailed rules and regulations for commodity trading companies, for example, in order to diminish tax risks and improve transparency. Although some interviewees pointed out that the introduction of more restrictive rules and an increased demand for transparency for commodity trading companies in the United States has probably been one contributing reason for such companies to gradually leave the United States, it is clear that raising the requirements on transparency and openness in as many countries as possible will gradually spill over to new countries. Over time, when the number of countries that have adopted more stringent rules increase, this transparency could help reduce tax risks. For example, public pressure on

the British government to combat illicit financial flows and corruption in general could also become a positive factor for the special case of mineral and metal trading.[21]

6.4.3 Strengthening the Legal Framework for Commodity Trading

In addition to improving the detection and mitigation of tax risks pertaining to mineral and metal trading, host country governments may choose to adopt certain legal responses. Below are some such potential measures listed.

a. Legislate the compulsory registration and filing of sales contracts related to commodity exports

Host countries could legislate that each export contract needs to be registered and filed prior to an export permit being given. The contracts would not necessarily be made public but would be available in full for tax authorities and other relevant authorities.[22] The contracts would facilitate tax authorities' and customs authorities' handling of each trade. This could further be linked to increased transparency through the mandatory publishing of certain key details of the export sales, with an appropriate time lag (e.g., 2–3 months) to avoid complications related to trade secrets. Such details could include: seller, buyer, location of buyer, specific details of the commodity (i.e., volume, detailed composition and type), price, taxes and fees paid, intended destination, etc.

In Chile, Cochilco, a government organization reporting to and advising the Ministry of Mines (Ministerio de Mineria), oversees imports and exports of copper and copper by-products. The commission verifies that all export sales are made at market prices and reports violations to the Internal Revenue Service and the Customs Service. Standard procedure requires all copper exporters to register with Cochilco and file sales contracts with the Mining Export System (Sicex) platform. Cochilco further oversees compliance with mining-related foreign investment contracts.[23]

b. Right of approval

Host countries could require approval of trading arrangements, especially streaming agreements. While it would be overly onerous on companies for government to have to approve one-off trades, it may be reasonable for longer-term trading agreements involving streaming, prepayment or finance, where there is more at stake for the host country. In order for government to review the arrangements, it will require documentation, for example: the contract with the mineral and metal trading company, production volumes, assay results, investment plans, competing offers from other mineral and metal trading companies, and the cost of borrowing from commercial banks. The government could legislate a requirement for miners to submit these categories of documentation to the revenue authority.

[21] One example of such pressures is given in a recent issue of *The Economist* (October 13–19, 2018) (The Economist, 2018a, p. 14; The Economist, 2018b, p. 66).

[22] This is in relation to export contracts and sales contracts between an independent miner and a commodity trading company and has nothing to do with state-owned companies and the EITI's recommendation to publish contracts.

[23] For more information, see: https://www.cochilco.cl (in Spanish).

c. Legislate the use of recognized prices in contracts

To limit the risk of underpricing in relation to agreed price within a contract or the value of the produced volumes in relation to royalty calculations, the host country government should legislate that any contract should take as its base a globally recognized price. This has been applied in Chile, where Cochilco is the responsible entity.

d. Legislate the use of recognized prices for calculating income tax and royalties independent of sales price.

To limit the risk to revenue, the host government could mandate that mining companies use publicly quoted prices to calculate sales revenue for royalty and income tax purposes independent of what the contract states. This way, if the mining company sells its production to a commodity trading company at a below-market price, government revenues are not affected. A globally recognized price would then be used as a basis for calculating sales revenue, with the mine bearing the cost if the traded price is lower. There is precedent for this in the mining sector in the context of related-party sales—the approach is called the "sixth method."[24] Zambia, for example, has implemented this method for base and precious metals since 2008 in order to facilitate tax calculations and tax collection.[25] In the oil sector, "norm pricing" is used to price crude oil sales between both related and unrelated parties. Not all mineral products have a globally recognized price. In these cases, the method may not be feasible, but a transparent pricing formula should be used by the company. A simpler way is for the tax authority to check tax filings against internationally recognized prices to make sure they are in line with global prices.

e. Strengthen financial disclosure by commodity trading companies in home countries

Host country governments may find it difficult to determine the level of risk associated with a trading deal given the opaque nature of most commodity trading companies. Home country governments can assist on two fronts. First, by mandating a greater level of public financial disclosure by privately owned commodity trading companies. In Switzerland, only publicly listed companies, banks, specific finance companies and insurance companies must file financial statements (Baker Tilly International, 2013). Thus, trading companies are overlooked. By contrast, in Sweden, all limited liability companies must submit an annual report, which should include a profit and loss statement, a balance sheet and a financial statements approval. According to the Swedish Public Access to Information and Secrecy Act, most information that is submitted to the Swedish Companies Registration Office, for example annual reports, is considered public. This means that anyone can demand to see any annual report.[26]

The second approach for home country governments to improve access to information is by publishing aggregated data on trading companies. For example, Australia has amended its bill on the Automatic Exchange of Information to include the requirement that aggregated information about accounts held in Australia be published every year by the Australian Tax Office (Meyer-Nandi, 2018). This measure would allow host country governments to find out more about trading companies. However, the Automatic Exchange of Information has its limitations. Exchange Of Information (EOI) in relation to bank details and tax accounts between countries are a more appropriate tool to understand the commodity trading

[24] See United Nations (2017a) for further information on the "sixth method."

[25] See Readhead (2017a) for more information on the "sixth method" in Zambia.

[26] For more information, see https://bolagsverket.se/ (in Swedish).

companies. As EOI procedures can be agreed on by request etc., it can be specifically relevant for the investigation of commodity trade mispricing (Musselli & Bürgi, 2019). Thus EOI procedures should be implemented by both home and host countries. As Aarsnes (2011) points out, country-by-country reporting is the only means to establish whether or not any unlawful transfers have taken place. This would mean that host country governments could access information from trading centres such as Switzerland, London and Singapore, while developing their capacity to provide information in return.

7.0 Discussion

Mineral and metal trading companies are to some extent necessary for the smooth functioning of global minerals and metals markets. For some mining companies, they are de facto the only available option to get their products to the market. This is particularly true for small and mid-sized mining companies in emerging economies.

Trading companies act as a conduit between original sellers and the ultimate buyers that, for a variety of reasons, are not able, or willing, to act directly in the market. It might be that these companies are too small or do not have enough knowledge and/or resources to participate, whether through a scarcity of finance, skills, experience and/or staff.

The Internet and improved communication channels around the globe have made it easier for mining companies to trade directly but the information advantage of the specialized commodity trading companies will remain a competitive advantage.

The possible tax risks created by mineral and metal trading companies must be measured against the benefits they create. Mineral and metal trading companies are middlemen creating links between buyer and seller. In such a role, they represent an additional cost, in theory reducing profits for both buyer and seller, and potentially reducing the taxes paid, creating tax risks for the host country. In many situations, however, the trading companies offer an alternative to no trade at all or reduced volumes of minerals and metals sold. Consequently, in the long run, the trading companies could create additional revenue streams and increased tax payments compared with a situation where trade in the commodity is reduced.

To a large extent, mineral and metal trading companies build their activities and business on a detailed and up-to-date understanding of the markets in which they operate. In contrast to miners, they can concentrate on the logistics and market developments, whereas mining companies must focus on the extraction process.

Mineral and metal trading companies do not need large investments in fixed assets, but only sufficient working capital to cover the products under their control. Commodity trading companies are hence often private and traditionally not transparent in their business, and this can create further tax risks and other potential problems for both the host and home countries alike.

Although there are some very large international commodity trading companies, most of these companies are small. In principle, they can operate out of any countries that offer conducive legal and tax conditions. In addition, the market knowledge the mineral and metal trading companies get while dealing with physical transactions and real customers, sellers and buyers can be (and often is) used for speculation.

Against this background, it is logical that the mineral and metal trading companies are less risk averse than companies like mining and smelting companies that have large fixed investments and shareholders to whom they are responsible. The latter is a freedom of particular advantage for traders in speculative

operations, where profits may be large but are often risky. This way of doing business may increase risks to the tax revenue of host and home countries alike.

In recent years, the financial capacity of commodity trading companies has become more important, in particular since the global financial crisis in 2008–2009. This is due to the retreat of banks from financing much of the mining industry.

Commodity trading companies have increasingly had to extend their credit lines and loan facilities. In the absence of shareholders, those banks that are willing to finance the sector have become an important pressure group. Increasing demands for transparency by governments and civil society on those banks that finance the sector could hence have strong indirect influence on the commodity trading companies.

For the future, it seems that the mineral and metal trading sector will become more concentrated, with the disappearance of the traditional role of trading companies as mere middlemen. The growing importance of the financial capacity of a commodity trading company will further favour the large trading companies.

Two factors support this trend: (i) the need for operating and investment capital by many small mining companies, and (ii) the need for substantial logistical investments, such as in ports and trading routes, by the commodity trading companies themselves. As China is the largest importer of minerals and metals globally, the role of Chinese mineral and metal trading companies will most likely increase.

A continued move eastward in the centre of gravity of the mineral and metal trading world is highly likely. This will probably, at least initially (according to the interviewees), mean that tax risks will increase as, in general, Chinese companies are less transparent than their European and North American competitors. It is also important to note that it is not possible to generalize over the vast spectrum of Chinese mineral and metal trading companies, and that more data is available than generally perceived within China. This does not change the fact, however, that China is a less transparent country than many others. There are companies there that adhere to international best practices, fully or partially, but there are other Chinese companies that ignore them.

The tax risks that mineral and metal trading companies create through their existence and their practices are predominantly in relation to profit-based fiscal instruments. These risks are, by their nature, difficult to deal with. There is no panacea to solve or counter these problems. They are not, in principle, different to tax risks of the same type when mining companies themselves are selling their mineral and metal products.

The transfer pricing issues are outside the scope of this study, but it can nevertheless be underlined that very few commodity trading companies own mines, thus transfer pricing is generally not an issue when examining mineral and metal trading companies. Indeed, mineral and metal trading in general does not raise particularly difficult transfer pricing problems, as the business models used are relatively simple and do not usually involve difficult-to-value intangibles. The products traded are often easily measurable, at least compared to industrial goods and services, and comparable data for prices and qualities are in most cases available.

Few commodity trading companies have moved upstream (i.e., into the exploration and extractive aspects of the industry), so transfer pricing risks related to the purchase of mineral production by a commodity trading company are likely to remain limited because of the arm's length nature of the transactions. An important exception is Glencore, which is deeply involved in both the mining and trading of minerals and metals. If additional trading companies invest in mining activities, the transfer pricing problems will warrant a closer examination.

As we have seen, the business models generally used by mineral and metal trading companies do not create specific tax risks, other than those generated by the general veil of secrecy around the trading activities and the high risks the trading companies are willing to take. Nevertheless, we have made suggestions that would further diminish the risks of tax evasion. These recommendations have evolved from this study for host and home countries alike and are presented in the next section.

8.0 Conclusion

How are commodity traders involved in buying and selling mineral production from private mining companies in host countries?

There are at least 2,000 mineral and metal trading companies around the world. Many of them are small companies focused on specific, often specialty, metals, while a few are global giants trading in a wide range of minerals and metals (such as Glencore, Vitol, Mitsubushi and CITIC).

Chinese trading companies are already the most numerous and are gradually becoming more important, following the emergence of China as the largest importer of metals and minerals. The trading companies are risk-taking middlemen that provide the link between sellers (mining companies) and buyers (users of minerals and metals).

These companies have traditionally been privately held, and hence less transparent than listed companies. Some companies like Trafigura are, however, gradually becoming more transparent. The main competitive advantage of these trading companies has traditionally been knowledge of both buyers and sellers. In recent years, with increasing flow of information around the world, the trading companies have expanded their offering with financial services and infrastructure facilities.

For copper, iron ore, nickel and zinc, which are the most important metals in terms of volume and value (along with gold), trading companies account for between 20 and 40 per cent of the total world trade. Most of these trading companies are dealing in arm's length trading and are important for the smooth functioning of global markets.

Most trading companies do not own mines (Glencore is the most important exception). The reason for this is partly the lack of financial resources of most small trading companies and partly the very different corporate cultures in mining companies and trading companies. The former is capital intensive and slow moving, while the latter is a risk-taker where the speed of transactions is important.

Do these transactions create risks for host country governments? If so, what are they?

As middlemen, the trading companies increase costs for both buyer and seller. In theory, they reduce profits for both parties, so they potentially lower the tax paid by miners and users alike. Aside from this one, the mineral and metal trading companies do not create any major tax risks, as most of them are not vertically integrated. Companies with their own captive mines do, however, create some risk of transfer pricing.

With the trading companies' increasing role as financers of mining projects, the interest rates used and other lending conditions should be surveyed and compared with going market rates. The non-arm's length transactions of trading companies that own mines are generally considered less difficult to disentangle, as they generally can be compared with globally recognized prices and do not include aspects that are difficult to value.

What effects might these tax risks have on government revenue collection in host countries?

The effects of trading companies' activities on taxes paid are limited, as most of the trading is done at arm's length. Trading of products from mines that are owned by trading companies necessitates special care, as does all trading within the same group of companies. The new role for trading companies as an important source of funding for mining projects is likely to increase future tax income when these mines come into production.

8.1 Recommendations

How could these tax risks be addressed? What actions could home countries take to help host countries?

The following recommendations are related to tax risks from the sale of minerals and metals made by a commodity trading company. The recommendations are based on those previously made by organizations such as the NRGI, the EITI and the UN to the extractive industry.

In order to understand and combat tax risks, certain information at various levels is necessary for host and home countries alike. It is fundamental that there is:

- Complete knowledge about the exported (or imported) commodity.
- An understanding of the details of the sales contract.
- Access to up-to-date information about the market situation for each commodity concerned including globally recognized prices.

In order to gain an understanding of the exported commodity, it is recommended that a governmental body or similar authority is created in the host country with the mandate to:

- Collect and file sales contracts, in full, linked to exports of commodities for the benefit of the host country authorities.
- Analyze exported commodities to verify the quality and composition of the commodity.
- Issue export licences once details of the sale and product are verified.

The governmental body should have close ties to other relevant authorities, such as the tax authority, customs authority, and ministries of mining and trade.

8.1.1 Tax Authorities

Tax authorities, or another relevant organization/authority depending on the structure of the governmental bodies in the host/home countries, need to have a good understanding of the mining and trading industries to be able to assess individual deals. For example, authorities need to:

- Establish whether the companies trading are independent from each other.
    - If not, establish if the transaction between the mining company and the commodity trading company is done at arm's length.

- Establish whether there are financial agreements between the buyer and the seller.
    - If so, are those in line with prevailing market practices?
    - With respect to streaming agreements, establish if the sales revenue forgone is appropriately compensated by the upfront payment.
- Establish whether the fee or commission paid to the commodity trading company is appropriate.
- Demand justification as to why an income stream is taxed in a specific tax jurisdiction.
    - Consider whether the trading company's activities have added value to the deal—whether it is reasonable for the operations to compensate that specific entity.

The tax authority or another relevant authority must thus have:

- General knowledge about demand and supply developments, understanding the structure of the market and present trends.
- Further details such as conditions generally applied, payment terms, shipping conditions, premiums or reductions offered. This knowledge will make it easier to judge if the terms of a specific deal are in line with general market practices.
- Access to up-to-date information about the market situation for each commodity concerned.

Capacity building in all authorities engaged with the mining sector, and with companies exporting minerals and metals, is fundamental to the realization of these recommendations. This can be supported through information sharing between relevant authorities at home and in the host countries and by international cooperation organizations.

8.1.2 Strengthening the Legal Framework

To strengthen the legal framework in home and host countries, the following recommendations should be implemented:

- Legislate a right of approval by government of trading agreements above certain values.
- Legislate the use of globally recognized prices in contracts.
- Legislate the use of globally recognized prices for related-party mineral and metal trade.
- Legislate increased financial disclosure by commodity trading companies.
- Legislate a greater level of public financial disclosure by privately owned companies.
- Introduce a tax system and tax regulations, including royalties, which are calculated on data and information that is easy to check, such as volume shipped, quality of product (grade and other similar readily available data), and not dependent on the cost of production, shipping or other cost items that cannot be controlled.
- Base value calculations for tax purposes on globally recognized prices and practices and define them in detail.

8.1.3 Transparency

The business model of commodity trading is problematic, as it is most often non-transparent. In order to increase transparency, home and host countries should:

- Reduce the opportunities for corrupt behaviour by becoming part of the EITI or similar international cooperation agreements.
    - Mining and commodity trading companies should become supporting members of the EITI or similar international cooperation agreements.
- Publish, with an appropriate time lag, certain key details of the export sales.
    - Such details could include: seller, buyer, location of buyer, specific details of the commodity (e.g., volume, detailed composition and type), price, taxes and fees paid, and the intended destination.
- Home countries should collect and publish aggregated data, for example: revenues, costs, traded volumes, imported volumes, taxes paid and people employed by the trading companies.

References

Aarsnes, F. (2011). *Protection from derivative abuse. Publish What You Pay Norway*. Retrieved from https://www.publishwhatyoupay.no/sites/all/files/1006a-PWYP_DerivativesReport_ENG_DOWNLOAD_0.pdf

Baker, R. W. (2005) *Capitalism's Achilles Heel: Dirty money and how to renew the free-market system*. New Jersey: John Wiley & Sons.

Baker Tilly International. (2013). *Doing business in Switzerland*. Retrieved from https://www.taitwalker.co.uk/wp-content/uploads/2014/10/Doing-Business-Guide-Switzerland.pdf

Berne Declaration (Ed.). (2012). *Commodities: Switzerland's most dangerous business*. Retrieved from https://www.publiceye.ch/fileadmin/files/documents/Rohstoffe/commodities_book_berne_declaration_lowres_01.pdf

Berne Declaration. (2014). *A supervisory authority to combat the regulatory lacuna in the commodities sector: How the resource curse is connected to the Swiss trading hub and the political responsibility that results*. Retrieved from https://www.rohma.ch/fileadmin/files/documents/14_295_EVB_ROHMA_Paper_A4_EN_FINAL_LowRes.pdf

Burgis, T. (2015). *The looting machine: Warlords, oligarchs, corporations, smugglers and the theft of Africa's wealth*. New York: Public Affairs.

Chêne, M. (2016). *Linkages between corruption and commodity trading* (U4 Expert Answer). U4 Anti-Corruption Resource Centre. Retrieved from https://www.u4.no/publications/linkages-between-corruption-and-commodity-trading/pdf

Carbomax. (2018). *Årsredovisning för Carbomax AB 2017*. Retrieved from https://www.hitta.se/f%C3%B6retagsinformation/carbomax+ab/5564495744

Cargill. (2018). *Annual report 2017*. Retrieved from https://www.cargill.com/doc/1432094802973/2017-annual-report.pdf

CCI. (n.d.). Home. Retrieved from http://www.cci.com/

CITIC. (2018). *Annual report 2017*. Retrieved from https://www.citic.com/ar2017/download%20center/en/e00267.pdf

Crowson, P. (2008). *Mining unearthed: The definitive book on how economic and political influences shape the global mining industry*. United Kingdom: Aspermont.

EBP. (2017). *Expert study on the Swiss gold sector and related risks of human rights abuses*. Retrieved from https://www.menschenrechte.uzh.ch/dam/jcr:17ebcb16-898e-40df-bc07-e993f5639e49/Expert%20Study%20Swiss%20Gold%20Sector_2017.pdf

The Economist. (2018a). Dirty capital: London's financial flows are polluted by illicit money. *The Economist, 429*(9113).

The Economist. (2018b). Awash: Money laundering in London. *The Economist, 429*(9113).

Extractive Industries Transparency Initiative (EITI). (2016). *The EITI Standard 2016*. Retrieved from https://eiti.org/sites/default/files/documents/the_eiti_standard_2016_-_english.pdf

Extractive Industries Transparency Initiative. (2018). *Factsheet: The global standard for the good governance of oil, gas and mineral resources*. Retrieved from https://eiti.org/sites/default/files/documents/eiti_factsheet_en_feb2018.pdf

Ericsson, M. & Löf, O. (2017). *Mining's contribution to low- and middle-income economies*. (WIDER Working Paper 2017/148). Helsinki: UNU-WIDER. Retrieved from https://www.wider.unu.edu/sites/default/files/Publications/Working-paper/PDF/wp2017-148.pdf

Glencore. (2018). *Annual report 2017*. Retrieved from https://www.glencore.com/dam/jcr:62bed41c-1627-4bf5-bc43-cf5518ba1193/glen-2017-annual-report.pdf

Gunvor. (2018). *Gunvor 2017 Group summary*. Retrieved from https://gunvorgroup.com/wp-content/uploads/2018/09/GunvorGroupSummary_2017_V6.pdf

Gylfason, T. (2018) Political economy, Mr. Churchill, and natural resources. *Mineral Economics, 31*, 23–34.

Hume, N. Sheppard, D., & Sanderson, H. (2018). Glencore: An audacious business model in the dock. *Financial Times*. Retrieved from https://www.ft.com/content/c9e674b0-8105-11e8-bc55-50daf11b720d

Humphreys, D. (2015). *The remaking of the mining industry*. Palgrave Macmillan.

Humphreys, D. (2017). *The mining industry after the boom*. Presentation to the XIV Mining Seminar, CEPMLP, Dundee.

Iceberg Research. (2015). *Noble Group, a repeat of Enron. First Report: Noble's Associates and Noble Agri*. Retrieved from https://icebergresearch.files.wordpress.com/2015/02/report-1-associates-and-agri-15022015.pdf

Iceberg Research. (2017). Noble Group is sinking. This saga reveals the complete failure of the regulators in Singapore. Retrieved from https://iceberg-research.com/2017/08/03/noble-group-is-sinking-this-saga-reveals-the-complete-failure-of-the-regulators-in-singapore/

International Council on Mining & Metals (ICMM). (2015). *Sustainable Development Framework: ICMM Principles*. Retrieved from https://www.icmm.com/website/publications/pdfs/commitments/revised-2015_icmm-principles.pdf

Institute for Human Rights and Business. (2017, March). *The Swiss commodities trading industry: A mapping study*. Retrieved from https://www.ihrb.org/uploads/reports/IHRB%2C_The_Swiss_Commodities_Trading_Sector_-_A_Mapping_Study%2C_Mar_2017.pdf

International Chamber of Commerce. (2010). Incoterms® rules 2010. Retrieved from https://iccwbo.org/resources-for-business/incoterms-rules/incoterms-rules-2010/

Johannesen, N. & Pirttilä, J. (2016). *Capital flight and development: An overview of concepts, methods, and data sources*. (WIDER Working Paper 2016/95). Helsinki: UNU-WIDER. Retrieved from https://www.wider.unu.edu/sites/default/files/wp2016-95.pdf

Koven, P. (2015). The dark side of metal streaming deals: Strapped mining companies trade future value for cash. *Financial Post*. Retrieved from https://business.financialpost.com/commodities/mining/the-dark-side-of-metal-streaming-deals-strapped-mining-companies-trade-future-value-for-cash

KPMG International. (2012). *Commodity trading companies: Centralizing trade as a critical success factor*. Retrieved from https://assets.kpmg.com/content/dam/kpmg/pdf/2015/03/centralizing-trade.pdf

KPMG International. (2016). *Clarity on commodities trading*. Retrieved from https://assets.kpmg.com/content/dam/kpmg/pdf/2016/04/ch-2016-clarity-on-commodities-trading-en.pdf

London Metal Exchange. (LME). (2018a). *The essential element of the physical market*. Retrieved from https://www.lme.com/-/media/Files/Trading/Physical-market-services/6943_LME_Physical-Markets_WEB_A4.pdf?la=en-GB

London Metal Exchange. (2018b). *A detailed guide to the London Metal Exchange*. Retrieved from https://www.lme.com/-/media/Files/Brochures/Detailed-Guide-to-the-LME.pdf?la=en-GB

Longchamp, O. & Perrot, N. (2017, June). *Trading in corruption: Evidence and mitigation measures for corruption in the trading of oil and minerlas* (U4 Anti-Corruption Resource Centre U4 Issue No. 6). Retrieved from https://www.u4.no/publications/trading-in-corruption-evidence-and-mitigation-measures-for-corruption-in-the-trading-of-oil-and-minerals.pdf

Löf, A. Ericsson, M., & Löf, O. (2018, November). Iron ore markets improve in most regions. *Enginering & Mining Journal, 219*, 48–55. Retrieved from https://emj.epubxp.com/i/1040429-oct-2018

Mercuria. (n.d.). Home. Retrieved from http://www.mercuria.com

Metal Bulletin. (2015, February 23). Feature: Who are China's top iron ore traders? Retrieved from https://www.metalbulletin.com/Article/3426878/FEATURE-Who-are-Chinas-top-iron-ore-traders.html

Metal Bulletin. (2017). *Metal & Steel Traders of the World Directory 2017* (7th ed). London: Metal Bulletin.

Metalla. (2017). What is streaming? Retrieved from https://www.metallaroyalty.com/what-is-streaming/

Meyer-Nandi, S. (2018). *Swiss policy coherence in international taxation: Global trends in AEOI and BEPS in development assistance and a Swiss way forward*. Zurich: Universität Zürich. Retrieved from https://www.shareweb.ch/site/Development-Policy/Documents/formAttachments/20181005_DEZA-Final_WorkingPaper_corrected.pdf

Mitsubishi. (2018). *Financial results for the year ended March 2018*. Retrieved from. https://www.mitsubishicorp.com/jp/en/pr/archive/2018/files/0000034567_file1.pdf

Musselli, I. (2017). *Agriculture, price stabilisation and trade rules: A principled approach* (World Trade Institute Advanced Studies, Vol 3). Retrieved from https://brill.com/abstract/title/35167

Musselli, I. & Bürgi, E. (2019). *Curbing commodity trade-related illicit financial flows: Tax transparency* (Working Paper No. R4D-IFF-WP07-2019). Retrieved from https://curbingiffsdotorg.files.wordpress.com/2019/01/r4d_iff_wp07-2019_jan2019-2.pdf

Natural Resource Governance Institute (NRGI) (2010). Oil, gas, and mining fiscal terms. Retreived from https://resourcegovernance.org/analysis-tools/publications/oil-gas-and-mining-fiscal-terms

Natural Resources Governance Insititute. (2015, March). *Commodity trading: Converting natural resources into revenues* (NGRI Reader). Retrieved from https://resourcegovernance.org/sites/default/files/documents/nrgi_primer_commodity-trading.pdf

Noble Group. (2015). *Noble Group annual report 2014*. Retrieved from http://infopub.sgx.com/FileOpen/Noble%20Annual%20Report%202014.ashx?App=Prospectus&FileID=25326

Noble Group. (2016). *Noble Group annual report 2015*. Retrieved from http://www.thisisnoble.com/images/investors/financialInformation/annualReport/ar2015.pdf

Noble Group. (2017). *Noble Group annual report 2016*. Retrieved from http://www.thisisnoble.com/images/investors/financialInformation/annualReport/ar2016.pdf

Noble Group. (2018). *Noble Group annual report 2017*. Retrieved from http://www.thisisnoble.com/images/investors/financialInformation/annualReport/ar2017.pdf

Organisation for Economic Co-operation and Development (OECD). (2011). *OECD Guidelines for Multinational Enterprises*. Retrieved from http://dx.doi.org/10.1787/9789264115415-en

Organisation for Economic Co-operation and Development. (2016). *OECD due diligence guidance for responsible supply chains of minerals from conflict-affected and high-risk areas*. (3rd ed.). Paris: OECD Publishing. Retrieved from http://dx.doi.org/10.1787/9789264252479-en

Organisation for Economic Co-operation and Development. (2017). *OECD due diligence guidance for meaningful stakeholder engagement in the extractive sector*. Paris: OECD Publishing. Retrieved from http://dx.doi.org/10.1787/9789264252462-en

Østensen, Å. G., & Stridsman, M. (2017). *Shadow value chains: Tracing the link between corruption, illicit activity and lootable natural resources from West Africa* (U4 Anti-Corruption Resource Centre U4 Issue No. 7). Retrieved from https://www.u4.no/publications/shadow-value-chains-tracing-the-link-between-corruption-illicit-activity-and-lootable-natural-resources-from-west-africa.pdf

Östensson, O. & Löf, A. (2017). *Downstream activities: The possibilities and the realities* (WIDER Working Paper 2017/113). UNU-WIDER. Retrieved from https://www.wider.unu.edu/sites/default/files/wp2017-113.pdf

Östensson, O. (2018). Misinvoicing in mineral trade: What do we really know? *Mineral Economics, 31*(1–2), 77–86. Retrieved from https://link.springer.com/article/10.1007/s13563-018-0141-3

Payer, C. (Ed.). (1975). *Commodity trade of the third world*. Bungay, Suffolk: Macmillan Press Ltd.

Radetzki, M., & Wårell, L. (2017). *A handbook of primary commodities in the global economy* (2nd ed.). Cambridge: Cambridge University Press.

Raw Materials Group (n.d.). Raw Materials Data (databse).

Readhead, A. (2017a). *Special rules for commodity sales: Zambia's use of the 'sixth method'* (Natural Resource Charter Case Study). NRGI. Retrieved from https://resourcegovernance.org/sites/default/files/documents/special-rules-for-commodity-sales-zambia-sixth-method.pdf

Readhead, A. (2017b). *Toolkit for transfer pricing risk assessment in the African mining industry*. Bonn and Eschborn, Germany: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. Retrieved from https://www.bmz.de/rue/includes/downloads/2017_GIZ_Transfer_Pricing_Risk_Tool_EN.pdf

SG Investors.io. (n.d.). Noble Group Limited. Retrieved from https://sginvestors.io/sgx/stock/cgp-noble/share-price-history

Stena Metall. (2018). *Annual report 2017–2018*. Retrieved from. https://www.stenametall.com/siteassets/investor-relations/arsredovisning/annual-report_2017-2018.pdf

Swiss Federal Government. (2013a, March). *Background report: Commodities. Report of the interdepartmental platform on commodities to the Federal Council*. Retrieved from http://www.news.admin.ch/NSBSubscriber/message/attachments/30136.pdf

Swiss Federal Department of Finance. (2013b). *Report on international finance and tax matters 2013*. Retrieved from https://www.sif.admin.ch/dam/sif/en/dokumente/Publicationen/SIF_Bericht_2013_de_web.pdf.download.pdf/SIF_Bericht_2013_en_web.pdf

Tercero Espinoza, L. A. & Soulier, M. (2016). An examination of copper contained in international trade flows. *Mineral Economics, 29*(2–3), 47–56.

The Platform for Collaboration on Tax. (2017). *A toolkit for addressing difficulties in accessing comparables data for transfer pricing analyses*. Retrieved from http://www.oecd.org/tax/toolkit-on-comparability-and-mineral-pricing.pdf

Trafigura. (2018a). *Commodities demystified: A guide to trading and the global supply chain*. (2nd ed.) Retrieved from https://www.commoditiesdemystified.info/pdf/CommoditiesDemystified-en.pdf#Commodities-Demystified

Trafigura. (2018b). *Annual report 2017*. Retrieved from https://www.trafigura.com/media/364892/trafigura-2017-annual-report.pdf

Trafigura. (2019). *Annual report 2018*. Retrieved from https://www.trafigura.com/brochure/2018-trafigura-annual-report/23441

UN Comtrade. (n.d.). UN Comtrade Database. Retrieved from https://comtrade.un.org

United Nations Conference on Trade and Development. (2017). *The iron ore market 2016*. Retrieved from https://unctad.org/Sections/ditc_commb/docs/suc2016_IronOre_Flyer_en.pdf

United Nations. (2017a). *Practical manual on transfer pricing for developing countries*. Retrieved from https://www.un.org/esa/ffd/wp-content/uploads/2017/04/Manual-TP-2017.pdf

United Nations. (2017b). *United Nations handbook on selected issues for taxation of the extractive industries by developing countries*. Retrieved from https://static.un.org/esa/ffd/wp-content/uploads/2018/05/Extractives-Handbook_2017.pdf

United States Geological Survey (USGS). (2018). *Mineral commodity summaries 2018*. Retrieved from https://minerals.usgs.gov/minerals/pubs/mcs/2018/mcs2018.pdf

Vitol. (2018). *Vitol*. Retrieved from http://www.vitol.com/wp-content/uploads/2018/07/Vitol-Brochure-2018.pdf

Wheaton Precious Metals. (n.d.). Constancia Peru. Retrieved from https://www.wheatonpm.com/streams/constancia/default.aspx

Wogen. (n.d.). Home. Retrieved from https://www.wogen.com

World Bank. (2013). *World Bank commodities price forecast January 2013*. Retrieved from http://pubdocs.worldbank.org/en/803981461939724832/CMO-2013-January-forecasts.pdf

World Bank (2017, October 3). *World Bank commodities price data (The Pink Sheet)*. Retrieved from http://pubdocs.worldbank.org/en/773351507048031470/CMO-Pink-Sheet-October-2017.pdf

World Gold Council. (2018). Gold demand trends full year 2017. Retrieved from https://www.gold.org/research/gold-demand-trends/gold-demand-trends-full-year-2017/supply

Published by the International Institute for Sustainable Development.

Head Office

111 Lombard Avenue, Suite 325
Winnipeg, Manitoba
Canada R3B 0T4

Tel: +1 (204) 958-7700
Website: www.iisd.org
Twitter: @IISD_news

IISD

iisd.org