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Impact of International Trade Regimes on Mineral Beneficiation in  
Developing Countries: the Case of Fluorspar in South Africa

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A research report submitted to the Faculty of Engineering and the  
Built Environment, University of the Witwatersrand, in fulfilment of  
the requirements for the degree of Masters in Engineering.

## DECLARATION

I Phokojoe Refiloe Motsie, declare that this report is my own unaided work. It is submitted in partial fulfilment of the requirements for the degree of Master of Science in Engineering at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other University.



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Signature

17<sup>th</sup> February 2021

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Date

## **ABSTRACT**

Developing countries have long been relegated to the role of raw material suppliers. In order to diversify their economies, developing countries must transition their economies from being dependent on mineral extraction, to high-value add industries. The problem with the reliance solely on extraction sectors is that their economies are heavily exposed to market externalities such as demand and price fluctuations of commodities. Economic diversification is therefore key in advancing the developmental agenda of any country. The current structure of international trade regimes indirectly perpetuates the dependence of developing countries on supplying raw materials to developed countries then later import them as processed and finished goods. This phenomenon has led to low or lack of investment in value addition linkages in many developing countries. To further exacerbate the situation, import tariffs on processed products are generally higher than on raw materials, showing some tariff escalation disparity. This report investigated the impact of tariff escalation on processed goods as one of the main factors that impede local beneficiation in developing countries. The report also considered the contrasting views that in as much as there is a strong drive for developing countries to beneficiate their raw minerals, few have internal markets large enough to make them economically viable. In a bid to address the issue of turning comparative advantage to competitive advantage by considering tariff regime structures, the report looked at the value proposition that can be derived from the South African fluorspar industry as a case study by using the partial equilibrium modelling tool (SMART) from the World Bank. The SMART modelling tool was used because it allows for analysis of data at a disaggregated level and caters for comparison between different trade databases. From the results it was established that South Africa could stimulate downstream beneficiation activities in the fluorspar value chain by using the hybrid tariff structure to support the establishment of a fluorchemical industry.

## **DEDICATION**

This dissertation is dedicated to my late mother Mmatsolo “Poppy” Motsie, you have always been a pillar of strength in my life, you always believed in me and encouraged me to stretch myself. Thank you Mom.

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## LIST OF ABBREVIATIONS

AfCFTA	African Continental Free Trade Area
AGOA	African Growth and Opportunity Act
AHS	Effectively Applied Tariff
AU	African Union
AUC	African Union Commission
BITs	Bilateral Investment Treaties
BND	Bound Tariff
CaF <sub>2</sub>	Calcium fluorite
CFCs	Chlorofluorocarbons
CGE	Computable General Equilibrium
DMRE (DMR)	Department of Mineral Resources and Energy (former Department of Mineral Resources)
DSI (DST)	Department of Science and Innovation (former Department of Science and Technology)
EITI	Extractive Industry Transparency Initiative
EOI	Export Oriented Industrialisation
EPA	Economic Partnership Agreement
EU	European Union
FTA	Free Trade Area
F-Complex	Fluorochemicals Complex
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product

GSP	Generalized System of Preferences
HF	Hydrogen Fluoride
HFOs	Hydrofluoroolefins
HRD	Human Resource Development
HS	Harmonised Commodity Description and Coding System
IDB	World Trade Organization Integrated Database
IDC	Industrial Development Corporation of South Africa
IHS	Information Handling Service Consulting Firm
IMF	International Monetary Fund
IP	Intellectual Property
IPAP	Industrial Policy Action Plan
ISI	Import Substitution Industrialisation
ITO	International Trade Organization
MFN	Most Favoured Nation
MPRDA	Mineral and Petroleum Resources Development Act
NECSA	The South African Nuclear Corporation
NDP	National Development Plan
OECD	Organisation for Economic Development and Co-operation
PFCs	Perfluorinated Chemicals
PGMs	Platinum Group Metals
PTA	Preferential Treatment Agreement
PTFE	Polytetrafluoroethylene
R&D	Research and Development



RTA	Regional Trade Agreement
SARS	South African Revenue Services
SMART	Single Market Partial Equilibrium Tool
the dtic (the dti)	Department of Trade, Industry and Competition (former Department of Trade and Industry)
UNCTAD	United Nations Conference on Trade and Development
UNECA	United Nations Economic Commission for Africa
USGS	United States Geological Survey
WTO	World Trade Organization

## LIST OF SYMBOLS

\$	USA Dollar
%	percent
kt	thousand metric tonnes
Mt	million metric tonnes
Mtpa	million metric tonnes per annum
R	South African Rand

## **CHAPTER 1: INTRODUCTION**

### **1.1 Introduction and Context of the Study**

Throughout the world, natural resources potentially serve as an important source of wealth for a nation. Mineral endowments have the potential to effectively contribute to the economic and social wellbeing of a nation's citizens, as well as regions and localities where mining activities take place (Otto and Cordes, 2002). However, experiences have indicated that mineral wealth derived from natural resources alone is neither necessary nor sufficient for economic growth (OECD/United Nations, 2011). As a result, it is important for countries to have diversified economies to avoid being locked into a cycle of commodity dependence.

Mineral resources are finite in nature and the current rate of their exploitation indicates that this will impact on their trade distribution in future, hence the drive for mineral-endowed developing countries to convert their raw minerals into finished products (World Trade Organization, 2010a). There are many definitions for what constitute a developing country. The most common ways of defining a developing country is by gross domestic product per capita; gross national income; the state of industrial base; and human development index of a country compared with others (Australasian College for Emergency Medicine, 2015). The World Bank (2020a) classifies the world's economies into four income groups, viz., high, upper-middle, low-middle and low, determined by a country's gross national income per capita. Samuelson and Nordhaus in Domiter (2014), define a developing country as a country with relatively low real income per capita compared with other countries. According to the World Trade Organization (2020a), there is no established convention to describe a country as developing or developed, countries announce themselves whether they are developed or developing. The term developing countries in the context of this report is used to describe countries whose economies are still in developmental

stages and whose industrial base are less diversified. Developing countries such as South Africa are endowed with mineral resources and, to a large degree, their economies are dependent on the export of these raw minerals. The economies of most African countries are heavily affected by commodity cycles as their economic activity is largely dependent on extractive industries. This effect tends to be more pronounced in the case of least diversified economies than diversified ones.

Most developing countries tend to rely heavily on one sector of the economy that provides job security and generates revenue for the government for social development projects. The problem with the reliance on one sector of the economy is that the country is heavily exposed to market externalities such as demand and price fluctuations of commodities. Economic diversification is key in advancing the developmental agenda of any country (OECD/United Nations, 2011). While countries should strive for diversification in their economies, what is important is to build capacity in processed and manufactured goods as they present high returns on incomes and provides sustainable jobs. It has been noted that the prospect for value-added processing requires a different set of skilled labour compared to the current set of skills in most developing countries (Davis and Vasquez Cordano, 2013). This will also support the skills required for the next industrial era, the Fourth Industrial Revolution, which will be characterised by extreme automation and connectivity.

According to the World Trade Organization (2010b), most developing economies endowed with mineral resources export the bulk of their primary minerals and later import them as processed and finished goods. This phenomenon has led to low or lack of investment in downstream value addition facilities in many developing countries. To further exacerbate the situation, import tariffs on processed products are generally higher than on raw materials, showing some tariff escalation disparity even after the Uruguay Round of multilateral trade negotiations (Figure 1). This creates a

disincentive for mineral exporters, especially from developing countries, to further process their products as they will incur higher tariffs in export markets as a result of more processing (Korinek, 2018).

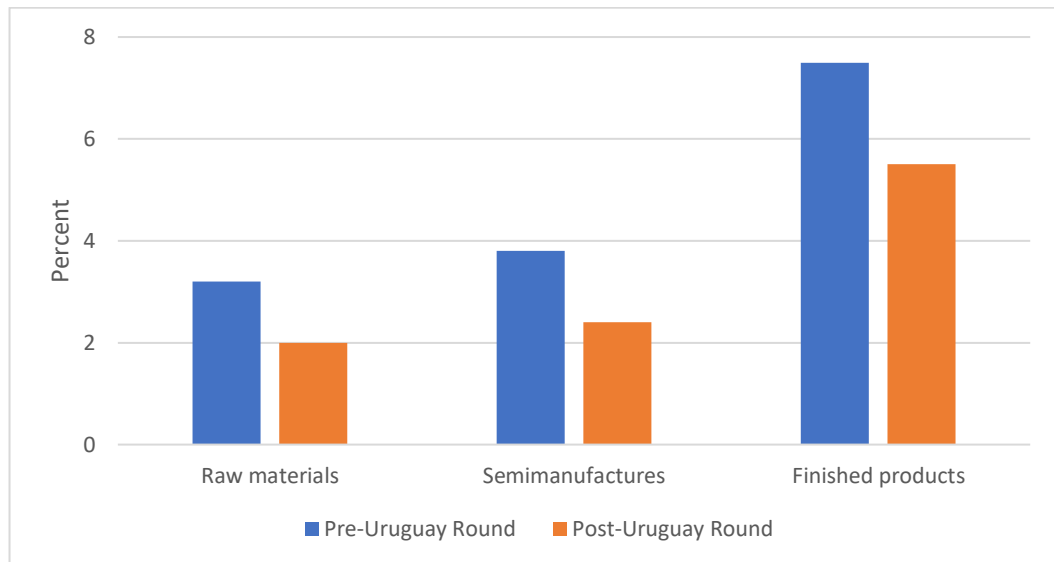


Figure 1: Cascading Tariffs on Natural-Resource-Based Products with the Level of Processing

Source: (Yarbrough and Yarbrough, 2011)

As much as there is a drive for developing countries to start benefiting their products, there seems to be a policy disjuncture between developed countries and developing countries. Developed countries have devised policies and strategies for securing supply of raw materials from developing countries, resulting in both intended and unintended consequences that impede economic diversification and development in developing countries. These effects prevent developing economies from transitioning from a position of suppliers of unbeneficiated primary minerals to value-added products.

Mineral beneficiation is simply defined as any further processing of a mineral beyond the stage where it represents a saleable raw material (Robinson and Von Below, 1990). The Department of Mineral Resources (2011), defines beneficiation as the “*transformation of a mineral (or a*

*combination of minerals) to a higher value product, which can either be consumed locally or exported". Both definitions are focused more on downstream value addition.*

Depletion of resources and expanded needs in developed countries due to industrialisation programmes, has led to developed countries classifying certain minerals as strategic (Davis, 2010). In a bid to ensure uninterrupted supply of raw minerals, developed countries tend to rely on free trade policies and institutions such as the World Trade Organisation (WTO) to ensure uninhibited access to raw minerals. They also support their companies to mine in developing countries and repatriate material. On the other hand, these policies ensure that developing countries remain reliant on their primary exports and do not move towards industrialisation (Baylis *et al.*, 2017).

Primary natural resources, such as agricultural goods and minerals, have been the key drivers of economic development in Africa. However, the OECD/United Nations (2011) points out that the lack of economic diversification and dependence on mineral resource commodities has put most States on the continent in a vulnerable position as mineral commodities are subjected to wide price fluctuations. Africa's great potential in mineral wealth is often unrealised because of a failure to transform raw minerals into value added products to further other economic activities, thereby broadening the country's economic base (OECD/United Nations, 2011). According to UNCTAD (2014), making the most of natural resources is a concept that needs to move beyond just capturing of rents. The host country should strive towards development of local content capacity where local suppliers add value to goods and services. Local procurement has the potential to generate great benefits to both local and foreign stakeholders (Maponga and Musa, 2020).

There are contrasting views on whether developing countries, especially African countries, should be pursuing diversification of their economies or maintaining the current production practice of relying on primary commodities. Economists grounded in neo-classical economic theory advocate for countries to focus on producing whatever is their comparative advantage instead of diversifying out of primary commodities into manufacturing (Hausmann *et al.*, 2008). However, Frankel (2012), has argued that for economic growth to take place, countries have to industrialise, and this requires government intervention through proactive industrial policies. Davis (1994), also supports economic diversification into manufactured products, arguing that income and price elasticities for primary goods are low but high for manufactured goods. However, he also cautions that having mineral endowment should not necessarily be assumed as having a comparative advantage for a case for mineral downstream beneficiation. The manufacturing sector is characterised by learning-by-doing, while the primary sector is not. However, Frankel (2012), points out that there is no reason this should only be the preserve of the manufacturing sector.

According to the World Trade Organization (2010a), although domestic markets are important in advancing beneficiation, the development of technology and marketing know-how is equally important to give a country a competitive advantage required to penetrate export markets. Mikesell *et al.* (1971), also stated that for successful materials production and vertical integration of finished products, developing countries require corporate organisations with affiliates in several countries beyond just capital injection to access world markets, which still holds. Regional integration may play an important role in consolidating local market demand to justify the case for beneficiation and product diversification (World Trade Organization, 2010a).

The concept of beneficiation is not new in South Africa. The then government passed a law in 1928, which led to the founding of Iscor (Pty)

Ltd, a state-owned entity, to reduce the country's reliance on imports (Tunyiswa, 2014). Iscor became the country's major steel producer with its mining division providing security of supply of iron ore to its steel mills.

South Africa's beneficiation strategy was adopted by Cabinet in 2011 as policy, and advocates for an increase in the level of value addition on mineral products to create opportunities for new enterprise development. The strategy further seeks to enhance the nation's productive capacity, which will lead to a diversified and knowledge-based economy. The strategy identifies five strategic mineral value chains, viz., Energy, Steel/ Stainless Steel, Pigment Production, Auto-catalyst and Diesel Particulate, and Diamond Processing and Jewellery (Department of Mineral Resources, 2011). This list is not exhaustive as other value chains such as polymers and chemical value chain, will later be considered for future economic modelling. The government further identified beneficiation of raw minerals among other strategies in the National Development Plan, as one of the key drivers to be considered for encouraging economic development (National Planning Commission, 2012).

South Africa's balance of payments has been skewed for many years in favour of its trading partners because of its history of being a raw mineral exporter and importer of manufactured products (Department of Mineral Resources, 2011). Unless a concerted effort is taken to stimulate local beneficiation, developed countries will continue to obtain raw materials in their crudest form from developing countries at the lowest costs (Bhengu, 2015). In order to diversify and grow their economies, resource-rich countries such as South Africa need to transition from exporting raw materials to exporting more manufactured products.

In as much as there is a strong drive for developing countries to beneficiate their raw minerals, few have internal markets large enough to justify the establishment of manufacturing enterprises on a scale that can make them



economically viable (Östensson, 2019). Although it makes sense for mines to produce semi-manufactured goods closer to a mine in order to achieve a certain degree of economies of scale, there is a tendency of international suppliers to channel procurement back to companies where intellectual properties are being held closer to markets (Leeuw and Mtegha, 2016). Robinson and Von Below (1990) identified the following aspects under the localisation theory that will attract beneficiation of raw materials to take place in the local market: production cost advantages, locational interdependence of firms, the existence of a consumer market at a specific location with the ability to attract production facilities. The locational advantage of producing crude resources should be used to establish resource-processing industries to provide feedstock to advance manufacturing and industrialisation (African Union, 2009). The National Development Plan (2012) also states that first stage beneficiation should be prioritised in areas where capacity already exists and beneficiation is likely to lead to downstream manufacturing. Stage 1 beneficiation focuses on converting minerals into concentrates from mining, recovery, reduction and smelting activities. Stage 2 focuses on converting mineral concentrates into intermediate products, it is the transition between the mining sector and the industrial sector. Stage 3 is the refining of intermediate products into high-value products. Stage 4 focuses on producing fabricated articles.

The research report will explore a case of fluorspar beneficiation in South Africa. Fluorspar is an industrial mineral with various applications. The country is the fourth-largest producer of fluorspar in the world at 0.18 Mt/annum, with reserves estimated at 41 Mt (Department of Mineral Resources, 2016b). However, the country exports most of its fluorspar in an unbeneficiated form. Figure 2 below illustrates the opportunity cost lost at different stages of the fluorspar value chain, which is the forgone benefit of not participating in a US\$22 billion per annum fluorspar finished products market. South Africa actively participates in the first three stages of the value chain.

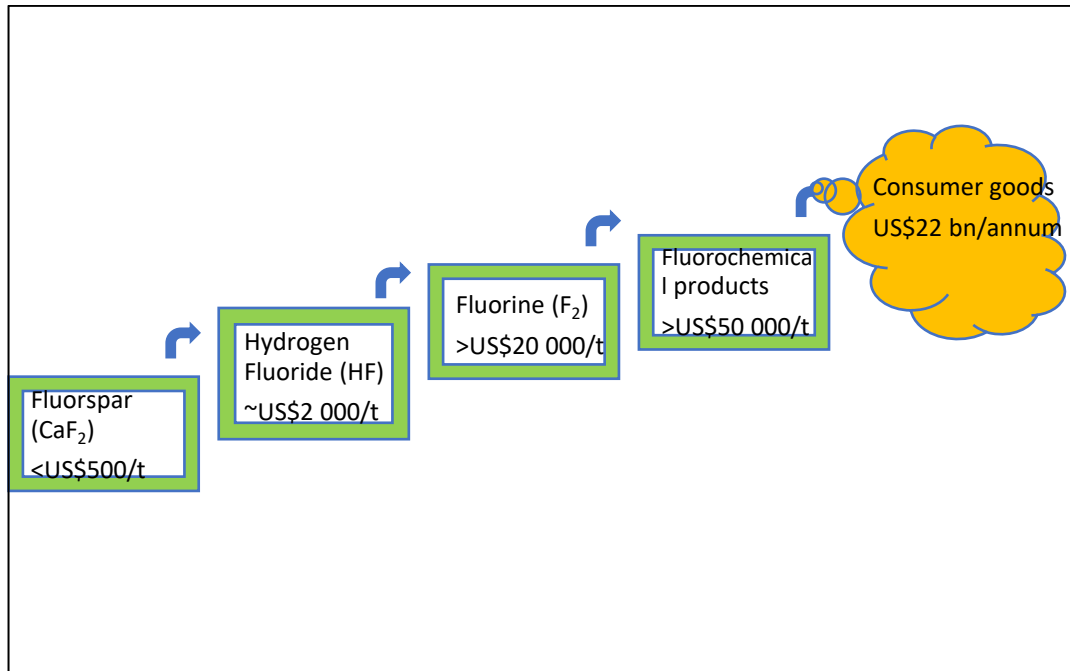


Figure 2: Fluorspar Value Chain

Source: Adapted from (Pelchem, 2011) and (Trade Map, 2018)

The global market for fluorspar products is estimated at US\$22 billion per annum (Trade Map, 2018). The bulk of South Africa's fluorspar is exported in its basic form as calcium fluoride (CaF<sub>2</sub>) and fetching about US\$500/t on the market, when it could be fetching in excess of US\$50,000/t if the products were further beneficiated downstream. Beneficiation can raise the unit value of South African exports provided input costs such as electricity are regulated in a manner to support business activity. It is therefore critical that the country identifies sophisticated resource-based products such as fluorochemical products to manufacture (National Planning Commission, 2012).

The knock-on effects of beneficiating fluorspar include stimulating the use of hydrogen fluoride (HF) and fluorine in other downstream production processes. Furthermore, this can result in the development of high-level skills, technology and creation of job opportunities in various supporting industries.

## 1.2 Problem Statement

There is a strong need to address the gaps in mineral trade policies and to determine the best practices that developing countries could employ in order to derive optimum value out of multilateral trade regimes. As it stands, international trade regimes seem to be perpetuating the notion of developing countries to remain as suppliers of raw materials.

Most developing countries have long been relegated to the role of raw material suppliers and import manufactured goods (Davis, 2010). In order to diversify their economies, it is imperative for developing countries to start moving from mineral extraction dependent economies and begin to add value to raw materials. As much as there is a drive for developing countries to start beneficiating their raw materials, there seems to be a policy disjuncture between developed countries and developing countries. One such example is the tariff escalation mechanism on processed goods, which unintentionally prevents developing economies from transitioning from a position of producers of unbeneficiated primary minerals to value-added products. Most developing countries do not pursue adding value to their mineral products because there is less incentive due to the high tariffs that are imposed on value-added products in consumer markets, which are mostly in developed countries. Developed countries tend to rely on the international trade mechanisms and relevant institutions such as the World Trade Organisation (WTO) to ensure security of supply of raw minerals into their markets, while restricting entrance of beneficiated products. The World Bank (2011, p.228) has also mentioned that tariff escalation “discourages imports of more processed varieties of the good (discouraging foreign processing activity) and offers domestic processors positive levels of effective protection”.

### **1.3 Research Objectives**

The objectives of this research are:

- To analyse the impact that international trade regimes have in advancing beneficiation of minerals in developing countries;
- To investigate possible mechanisms that can be used by developing countries, as signatories and members of these international trade regimes, to overcome barriers of trading value-added products, and optimally exploit opportunities that come with multilateral trade liberalisation systems; and
- To investigate the value chain of South Africa's fluorspar beneficiation as a case study.

### **1.4 Research Questions**

The questions to be addressed in the report are as follows:

- What impact do international trade regimes have in advancing beneficiation of minerals in developing countries?
- How can developing countries use multilateral trade liberalisation systems to overcome barriers of trading mineral value-added products?
- How can South Africa advance beneficiation of fluorspar products and penetrate international markets?

### **1.5 Importance of the Study**

The study aims to address the gaps in mineral trade policies and to determine the best practices developing countries could employ in order to derive optimum value out of multilateral trade regimes.

## **1.6 Scope of the Study**

The focus of this report will be more on international trade regimes in the form of tariffs, and their impact on downstream beneficiation in developing countries. The report also focuses on the processes and systems that international trade regimes, in particular the World Trade Organization, employ around mineral trade.

## **1.7 Hypothesis**

The current structure of international trade regimes indirectly perpetuates the dependence of developing countries on supplying raw materials to developed countries, and impede efforts by host governments to promote local beneficiation. Developing countries need to graduate from being raw material producers to manufacturers of value-added products in order to advance their economies.

## **1.8 Structure of the Report**

The study is sub-divided into seven chapters which aim to develop answers to the research questions and the research objective stated above. Chapter Two gives a comprehensive literature review on international trade, restriction mechanisms to trade, and the importance of beneficiation and economic diversification. In particular, the chapter focuses on international trade organisations and the implications of trade policies. Chapter Three outlines the research methodology used to conduct the research, which includes the research design and research tools applied to collect, analyse and test the data. Chapter Four analyses the trade flow of minerals with a particular emphasis on the impact of the application of import tariffs on raw materials from developing countries. The chapter also looks at international trade rules applied to mineral resources and how best developing countries can use these to optimise trade of their raw materials. Chapter Five is a

case study motivating for mineral beneficiation in South Africa. This will be done by looking at the value chain of fluorspar and lost opportunity costs in the industry by not adding value to the mineral. Chapter Six discusses the results and findings of the study in detail. Chapter Seven summarises salient points from all the chapters, the findings of the research and provides a conclusion for the study. Recommendations on possible further work will also be stated in this chapter.

## **1.9 Chapter Summary**

The introductory chapter gave the context of the study and outlined the research objectives, together with the research questions, to determine the impact of international trade regimes on mineral beneficiation in developing countries. The next chapter, which is the literature review, looks at economic principles and foundations that will assist in answering the research questions. It will discuss the fundamental trade theories and the importance of industrial policies on the advancement of economic diversification.

## **CHAPTER 2: LITERATURE REVIEW**

### **2.1 Introduction**

This chapter considers several trade theories drawn from literature, the period of their inception and the impact that trade restrictions have on a country's welfare. The chapter further looks at the history of international trade policy and how industrial policy can be used to advance economic diversification and competitiveness through mineral beneficiation. The chapter also states the important aspects that need to be established for beneficiation of raw materials to thrive in domestic markets.

### **2.2 Trade Theories**

Over the years there have been many economic trade theories (Figure 3). In the 1700s it was generally accepted that when a country exported raw materials and imported industrial goods this was regarded as bad trade, and the converse also held true in terms of bilateral trade (Reinert, 2007). If both countries traded industrial goods with one another this was called symmetric trade and it was considered good trade.

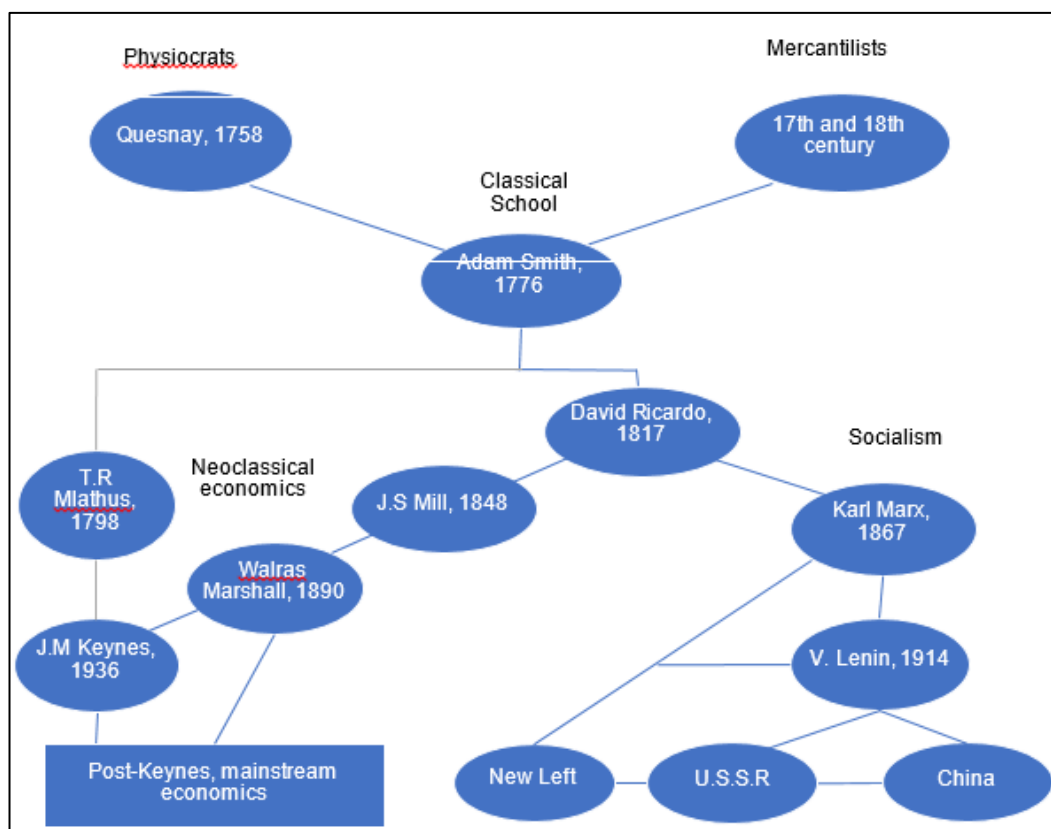


Figure 3: Family of Economics

Source: (Reinert, 2007)

Mercantilism is the first dominant theory of international trade and it prevailed from the renaissance until the early nineteenth century. The doctrine of mercantilism represented the dominant attitude towards international and advocated for tariffs and bounties to increase the quantity of money in a country (Paganelli, 2014). Mercantilists maintained that a nation needed to export more than they import to remain rich, a phenomenon still exhibited by many developed countries in this day and age, although most claim to be in favour of free trade (Salvatore, 2016). Mercantilists believed trade was a zero-sum-game and the gains from trade emanated from excess exports over imports in order to accumulate gold and silver bullion to finance other areas (Bernhofen and Brown, 2018).

However, David Hume in 1752, pointed out the weaknesses of the mercantilist theory - that it was not the amount of gold or silver that a nation



held that mattered, but the type of goods and services gold can buy (Yarbrough and Yarbrough, 2011). In 1776, Adam Smith also challenged the mercantilist thinking by suggesting that all parties involved in international trade can benefit by each country specialising in their absolute advantage by producing some commodities using less labour than its trading partners (Salvatore, 2016).

In 1817, David Ricardo showed that even Smith failed to capture the potential benefits of trade by showing that mutually beneficial trade is still possible even if one country does not have the absolute advantage in a specific commodity (Roncaglia, 2017). Ricardo articulated his concept as comparative advantage, which is a concept of opportunity cost, and the basis for today's unrestricted international trade. Taylor and Weerapana in Polley (2015, p.11) describes opportunity cost as *"the value of the next-best forgone alternative that was not chosen because something else was chosen"*.

In the twentieth century, Eli Heckscher and Bertil Ohlin took the concept of comparative advantage even further, by demonstrating the role of factor endowments that countries differed in factor abundance, and goods differed in factor intensity (Brue and Grant, 2012). The Heckscher-Ohlin theory states that a relatively labour-rich nation will export a relatively labour-intensive commodity and import a relatively capital-intensive commodity (Salvatore, 2016). Imperfect competition in international trade deals with product differentiation.

Neo-classical economic theory is based on perfect competition and equilibrium, a model which produces very little profit and leads to diminishing returns according to Reinert (2007). Unfortunately, the same model which seems to produce minimal economic growth results is adopted in industrial policy development of most poverty-stricken developing countries (ibid). As with any successful business, rich countries are rent

seekers whose rents lead to higher wages and a higher tax base. Their products for exports are developed under Schumpeterian-dynamic conditions of imperfect competition (Table 1).

Table 1: Characteristics of Schumpeterian activities vs Malthusian activities

<b>Schumpeterian activities ('good export activities)</b>	<b>Malthusian activities ('bad export activities if no Schumpeterian sector present)</b>
Increasing returns	Diminishing returns
Dynamic imperfect competition	Perfect competition (commodity competition)
Stable prices	Extreme price fluctuations
Generally skilled labour	Generally unskilled labour
Creates a middle class	Creates 'feudalist' class structure
Irreversible wages ('stickiness' of wages)	Reversible wages
Technical change leads to higher wages for the producer ('Fordist wage regime')	Technical change tends to lower prices to consumer
Creates large synergies (linkages, clusters)	Creates few synergies

Source: (Reinert, 2007)

Reinert (2007) argues that the introduction of free trade has resulted in the nations' reinforcement of the specialisation of factors of production. He points out that in a situation of relative economic independence in knowledge-intensive industries between a developed country and developing country, the most developed country will outcompete the least developed country and this will lead to the deindustrialisation of the developing country's economy. Tregenna (2015b), suggests that

deindustrialisation of an economy may lead to a fall in real wages and that the decline in manufacturing employment may negatively affect non-manufacturing employment. What creates wealthy nations are industrialisation and technological changes. Table 2, summarises some of the basic characteristics of different trade models.

Table 2: Trade Theories

<b>Gains from trade (causes)</b>	<b>Traditional trade theory (Ricardo, Hecksher-Ohlin)</b>	<b>'New' trade theory (Krugman (1980))</b>	<b>Heterogeneous firms models (Melitz (2003))</b>
Specialisation	Yes	No	No
Economies of scale	No	Yes	Yes
Pro-competitive	No	Yes	No
Variety	No	Yes	No
Aggregate productivity (through selection/reallocation)	No	No	Yes
Inter-industry	Yes	No	No
Intra-industry	No	Yes	Yes
Exporters and non-exporters within industries	No	No	Yes
Trade liberalisation affects relative factor rewards	Yes	No	No

Source: (World Trade Organization, 2008)

Ricardian model or the Heckscher-Ohlin model focuses on comparative advantage and specialisation of a country in a particular product that determine the relative autarky price (World Trade Organization, 2008). 'New' trade theory focuses on gains from economies of scale, product variety and increased competition motivated the importance of intra-industry trade. Heterogeneous firms model points out the importance of differences in firms contribute in international trade, departing from the simplified concept of all firms in a given industry are identical. The model focuses on resource allocation and new sources of gains from trade (ibid).

Rodrik in Siddiqui (2016) suggests that rich nations have a tendency to force poor nations to follow economic policies they themselves never followed during their developmental stages. The risk with globalisation is that rich countries tend to specialise in the high-skilled jobs in the value chain, while poor countries specialise in economic activities that rich countries can no longer mechanise or innovate any further (Reinert, 2007). Sometimes, technology and increasing returns can create economic barriers to entry into developing countries, resulting in some developed countries growing richer based on the economic power they wield under globalisation.

### **2.3 Globalisation and International trade**

Carmody (2011), notes that global economies and investment are characterised by network trade, whereby products go into deep integration and countries harmonise their laws and regulations in relation to trade and investment. Globalisation is a term used to describe the homogenisation of prices, products and wages, profits and rates of interests globally (Shariff, 2011). Baylis (2017), defines globalisation as the process of increasing interconnectedness between different parts of the world, such that an event in one part of the world has a potential to affect events and societies far away. Jackson and Sorensen (2003), also described globalisation as a

growing level of economic interconnection between nations, whereby component parts of the world become smaller and numerous. However, in some instances the benefits also come with the shedding of domestic jobs and periodic international financial crises. Examples include the Asian financial crisis in 1997, which affected developing countries, and the United States subprime housing mortgage in 2007, which affected the rest of the world in 2008 and 2009 (Salvatore, 2016).

Baylis et al. (2017), argue that as much as globalisation has led to the increase of global flows of trade and finance, the hotspots for globalisation and development have been concentrated in developed countries. Many developing countries remain largely bystanders in the new world economic order, with minimal connection to the current pattern of globalisation hotspots. The organisation of cross-border economic activities has focused on the most advanced sectors of the world economy partly because of political asymmetries in the global trade and finance, resulting in most gains from globalisation going to developed countries (Baylis *et al.*, 2017). Carmody (2011), further questions whether developing countries will ever be able to compete with developed countries under the current liberal economic regime, which institutionalises the advantages of first movers over latecomers.

Globalisation is not a new concept and can be traced as far back as 2000 years ago when the Roman currency was circulated in the empire. The first episode of globalisation, rapid trade and output growth began around the mid-19<sup>th</sup> century and continues today (Figure 4). The main drivers of globalisation are technological innovations, broader political change and economic policies (World Trade Organization, 2008). This report focuses on economic policies. Establishment of the Bretton Woods System in 1944 became a precursor to the formation of GATT in 1947, which later led to establishment of the WTO. Economic policy has played a big role in globalisation by deregulating and eliminating restrictions of international

trade and financial transactions (World Trade Organization, 2008). Developing countries initially had inward-looking commercial policies where import substitution had become the much preferred route for economic development. However, this changed over the years partly owing to the success of a number of newly-industrialising Asian countries that had adopted export-led growth strategies. However, the change in focus of inward-looking policies was also as a result of the debt crisis in the early 1980s (World Trade Organization, 2008).

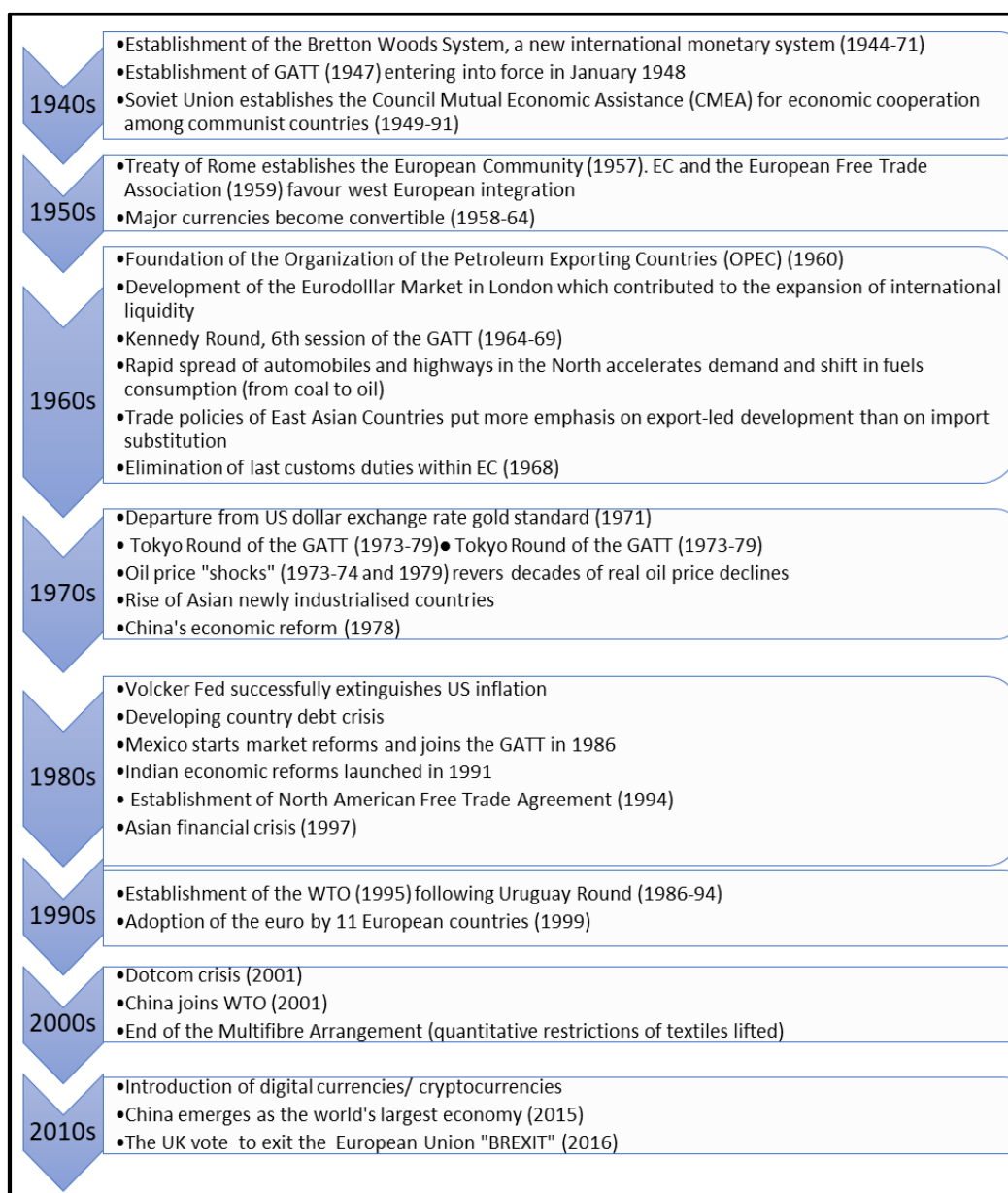


Figure 4: Globalisation Economic Chronology

Source: Adapted from (World Trade Organization, 2008) & (Amadeo, 2020)

Globalisation in 1870 – 1914 resulted from the industrial revolution in Europe and access to resource-rich countries to open new lands for food and raw material production (Salvatore, 2016). Economies of resource-rich countries were structured in a manner that supported industrialisation of Europe by ensuring uninterrupted supply of raw materials (Carmody, 2011). This period of modern globalisation ended with World War I in 1914, with the second period of rapid globalisation resuming towards the end of World War II in 1945 and extended to 1980. Pre-World War I globalisation had a few international institutions, but after World War II when the United States effectively became a global leader, it pushed for post-war globalisation to be based on international institutions (Baldwin, 2016).

The second period of rapid globalisation was characterised by an increase of international trade following the dismantling of heavy protection trade barriers, which were introduced during the Great Depression in the course of World War II (Salvatore, 2016). However, the previously occupied lands of settlements continued to export raw materials to developed countries in exchange for manufactured goods without advancing in industrial development. Reinert (2007), further argues that globalisation has become the new process of colonisation the same way as the Morgenthau Plan, whereby colonies were only allowed to produce raw materials.

According to Davis (2010, p.26), *“International trade consists of each country exporting the goods most suited to its factor endowment, technology, and climate, while importing the goods least suited for its national characteristics”*. There are two schools of thought holding opposing views with regards to whether international trade and free trade have benefited developing countries. Neo-classical economists believe that international trade has also benefited developing countries by allowing them to use their comparative advantage in production of mostly primary raw materials (Baylis *et al.*, 2017). In 2017, trade in manufactured products by Least Developed Countries (LDCs) and developing countries has been

reported to have improved from 24 percent to 35 percent and 64 percent to 70 percent respectively of the share of total merchandise exports compared with 2007 (Figure 5). The share of minerals increased from 12 percent to 20 percent for LDCs and 6 percent to 7 percent for developed countries in the same period (UNCTAD, 2019a).

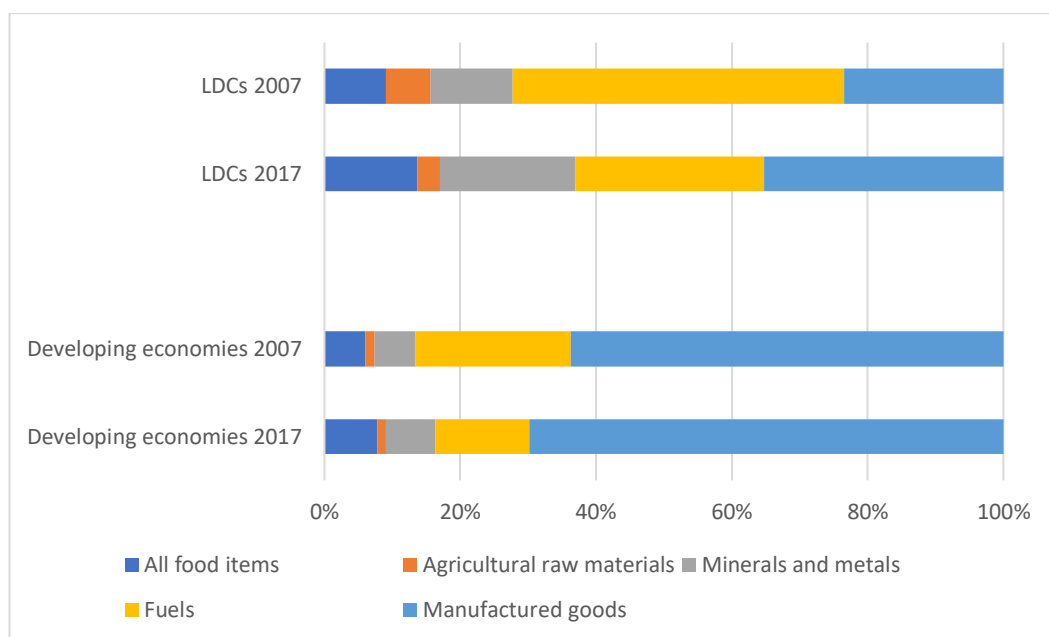


Figure 5: Export Structure by Product Group in LDCs and Developing Countries

Source: (UNCTAD, 2019a)

The other school of thought opposing the specialisation of developing countries in their comparative advantage, which in most instances are in the production of raw unprocessed materials, argued that nations can only experience meaningful growth through the development of industrial sectors (Baylis *et al.*, 2017).

Salvatore (2016), argues that the best policy for the world today is free trade, as nations can specialise in the production of commodities they produce efficiently and export them in return for other commodities they can produce less efficiently. However, having free trade as the centrepiece of development since the 1980s, has locked many less developed countries



into debt crises (Reinert, 2007). Baylis et al (2017), mention that free trade entrenches the position of the most efficient producers of commodities, which in most cases tend to be the developed countries, because it becomes very difficult for other countries to move towards industrialisation without the benefit of the trade walls. These neoliberal policies stunt the ability of developing countries to move into manufactured goods markets as they are trapped into producing raw material products with increased supply that leads to low prices.

Jackson (2003), states that global capitalism results in a process where wealth and development is generated in developed countries while the system creates poverty and underdevelopment in developing countries. Increasing and diminishing returns in trade theory points to the vicious cycle of poverty, therefore, ignoring these mechanisms may cause factor-price polarisation rather than equalisation (Reinert, 2007).

Reinert (2007), further points out that trade by nations at different levels of development often resulted in some nations advancing in specialisation while others only specialised in their comparative advantage, which resulted in them being poor by not being allowed the opportunity to emulate the factors that resulted in specialising countries becoming rich. For instance, Western powers arose through the advancement of emulation and fusion of non-Western ideas and technology as is the case in processing of many primary products such as cotton (Baylis *et al.*, 2017).

The Other Canon economics suggests that the process of development is driven by emulation and assimilation with less developed countries learning the economics structures and institutions of developed countries, as is the case with the Asian Tigers countries (Reinert, 2007). Asian Tigers countries are Southeast Asian countries, which underwent rapid industrialisation and have generally high economic activity. In the process of emulation and assimilation, economic growth tends to be more activity-specific,

characterised by increasing returns, technological advancement and imperfect competition. Furthermore, the process requires the transferring and mastering of skills and creation of viable markets because development of human capital without corresponding changes in productive structure will lead to emigration of the skills due to lack of demand. Unfortunately, the same phenomenon could not be emulated by poor countries because the imperialist system prevented rents from accruing to colonies stunting development in those countries, except in the Asian Tigers countries (Reinert, 2007). Traditionally, colonies were barred from developing manufacturing industries, resulting in economic activity with high growth being created around developed countries and those with diminishing returns in developing countries (Salvatore, 2016).

The growth of developed economies has been supported by the successful implementation of resource-based industrialisation strategies and diversification, which still contribute significantly to their economies (Baylis *et al.*, 2017). Trebilcock and Prado (2011) mention that many developing countries are caught in a poverty trap because of lack of investment and diversification of their economies, which prevent self-sustaining growth. Jackson and Sorensen (2003) argued that developing countries were subjected to underdevelopment as a result of a global capitalist system, which allowed developed countries to advance at the expense of the latter. They further stated that although developing countries may have been previously undeveloped, underdevelopment manifests itself with the arrival of global capitalism. To overcome the poverty trap and effects of underdevelopment, developing countries need to delink their economies from external dominance (Jackson and Sorensen, 2003).

Geographical distribution of natural resources and endowment play a critical role in explaining international trade because they are exhaustible and relatively concentrated in few locations around the world (World Trade Organization, 2010b). Traditional trade theory states that nations should

specialise in the production of commodities in their comparative advantage, which will increase world output through trade and each nation will share in the gain (Salvatore, 2016). However, most developing countries believe that this pattern of specialisation prevents them from sharing in the dynamic benefits that are brought about by industry development, and relegates them to a subordinate position of underdevelopment (Yarbrough and Yarbrough, 2011). The dynamic benefits resulting from industrial development are a skilled labour force, more innovation, high prices for exports, and higher wages for the workforce.

## **2.4 Trade Restrictions and Protectionism**

The biggest challenge facing current international economics on the trade side is the rising protectionism in developed countries in the pretext of a rapidly globalising world (Salvatore, 2016). This has seen many of the developed countries declaring certain minerals as strategic and aggressively ensuring the security of supply of such minerals. A recent example being the US, where an Executive Order was issued by the President of that country on 20<sup>th</sup> December 2017 that directed the development of a strategy that will reduce the reliance of the US on foreign supply for critical minerals (US Geological Survey, 2018). The European Commission also established the Raw Materials Initiative in 2008 to ensure uninterrupted access to minerals for economic development of their member states. The main parameters used to determine the criticality of the material for the European Union (EU) are based on economic importance and supply risk, which provides insight into the importance of a material in terms of end-use applications while considering the risk of supply of primary minerals from producing countries (European Commission, 2017).

There is a wide array of policy instruments generally imposed by all nations, which impact on trade of natural resources. These include tariffs, export taxes and quotas, amongst others (World Trade Organization, 2010b). Irwin

(2020) notes that import tariffs as the main instruments of trade policy are used mainly to raise government revenue, restrict imports and protect local producers from foreign completion, and reduce trade barriers. Tariffs were used to get developed countries' manufacturing sectors to the level of development they enjoy presently, however, prolonged use of tariffs posed a threat to the very same sectors (Reinert, 2007).

#### **2.4.1 Tariffs**

A tariff is a tax or duty levied on a traded good as it crosses a national border, which can both be levied on imported and exported goods (Salvatore, 2016). Historically, tariffs were used as a form of trade restriction, but over the years as countries increasingly reduce tariff rates, the use of other non-tariff trade measures, such as quotas, have increased (World Bank, 2010). Developed countries have expanded regulatory controls on public health, environmental and other non-economic activities.

Like any other tax, an importing country can use a tariff to reduce consumption of a particular good. A tariff can also be used to generate revenue for the exporting government. A country can also impose tariffs to discourage imports and improve their trade balance. The most common use of tariffs is as a protectionist policy to insulate the domestic market from competition by foreign producers of the same good (Yarbrough and Yarbrough, 2011). However, tariff protection in importing countries can also serve as an impediment to industrialisation as it reduces trade openness (Davis, 2010).

For member states of the WTO, tariffs can be classified into three types, namely, Most Favoured Nation (MFN), Bound Tariff (BND) and Preferential Tariff (World Bank, 2010).

**Most Favoured Nation tariffs** are tariffs imposed by WTO member states on each other on a non-discriminatory basis, unless a country falls under a preferential trade agreement such as custom union or free trade area. Preferential agreements are mostly reciprocal where members of a custom union agree to impose tariffs lower than the MFN tariff on each other's products. Preference may differ between partners and agreements. In most instances, wealthier countries would give developing countries unilateral preferential treatment without expecting any reciprocity.

**Bound tariffs** are specific agreements made by individual WTO member States, which are the maximum tariffs a WTO member State can impose on the products of another member State. The gap between the bound tariff and MFN tariff is called the binding overhang, this gap tends to be lower in developed countries compared to developing countries (Figure 6). It is assumed that the bigger the overhang the less predictable a country's trade policies.

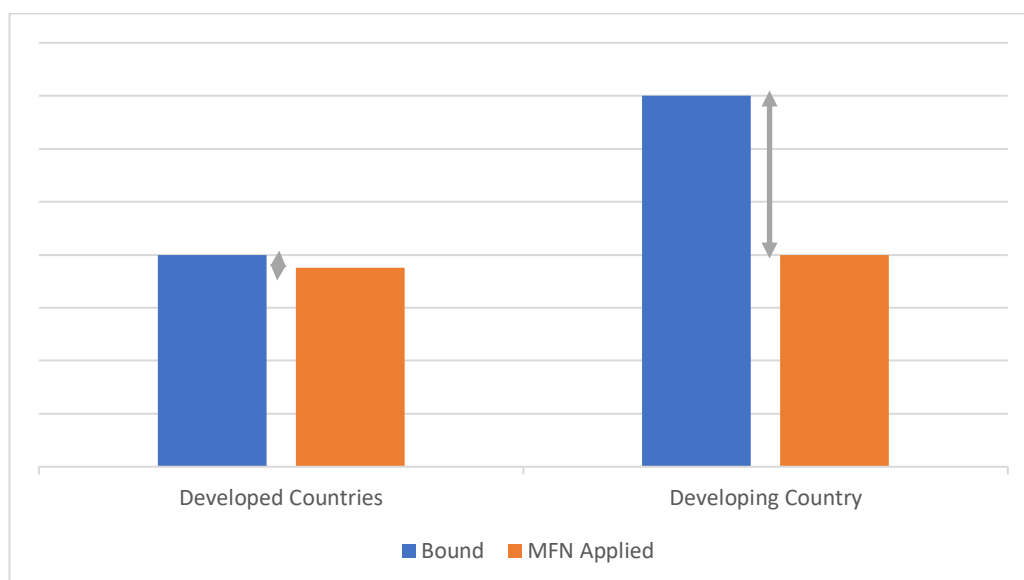


Figure 6: Binding Overhang Principle

Source: (World Bank, 2010)

**Preferential tariff** is the lowest tariff and will be used as an effectively applied tariff (AHS) if a preferential tariff agreement is in place between

countries (Figure 7). However, the MFN can also be used as effectively applied tariff by the importing country in instances where the products from other countries fail to meet the rules of origin under preferential tariff agreements such as the customs union and free trade areas. Therefore, AHS is the lowest available tariff that can be applied on a country's products by an importing country.

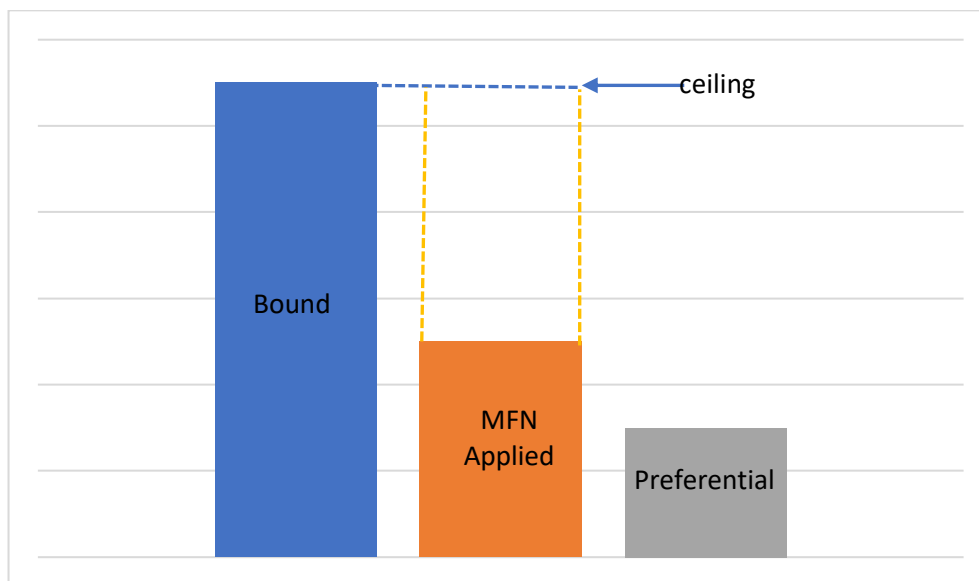


Figure 7: Comparison between Types of Tariffs

Source: (World Bank, 2010)

A tariff can take several forms regardless of whether it is bound or applied on MFN or preferential basis. The most common is ad valorem, that is, being expressed as a percentage of the value of a traded commodity. Secondly, a tariff can be expressed as a fixed sum per physical unit of the traded commodity, this is called a specific tariff. Finally, a tariff can be expressed as the combination of an ad valorem and specific tariff, this is called a compound tariff (Salvatore, 2016).

## 2.4.2 Export taxes

An export tax is a tax imposed by the host nation on goods leaving the borders of a country into the export market (Latina *et al.*, 2011). An export

tax contracts the world supply of the good on which it is imposed, at the same time increasing supply of a good in the domestic market. Therefore the domestic price will fall while the international price increases, leading to the welfare of domestic consumers increasing because of lower price. On the supply side, domestic producers will lose as they will sell at low domestic prices and pay tax on exports.

Latina (2011), cautions that an export tax may result in an aggregate efficiency loss, if a country's policy is to improve its welfare purely by imposing the tax. In this instance the term of trade gain will be matched by an equivalent loss for the imposing country's trading partner. Most resource-rich countries impose export taxes on minerals to redress the structure of protection they face in export markets, where tariff rates have a tendency to escalate with the stage of processing (World Trade Organization, 2010b).

### **2.4.3 Other trade barriers**

The other forms of trade restrictions are known as nontariff barriers, they are comprised of quotas, voluntary export restraints, international cartels, dumping, export subsidies covering international trade (Yarbrough and Yarbrough, 2011). Furthermore, there are other protectionism methods such as REACH, which stands for Regulation, Evaluation, Authorisation and Restriction of Chemicals. These types of protectionism methods use technical administrative processes such as safety regulations, health regulations and labelling requirements to exclude goods from entering into a country (Maxim and Berger, 2020).

A quota is a quantitative restriction, which directly limits the amount of a commodity to be imported or exported (Salvatore, 2016). Voluntary export restraint is a negotiated agreement, where an importing country induces the exporting country to voluntarily reduce its exports of a commodity under the threat of applying higher all-around trade restrictions. An International cartel

is an organisation of suppliers of a commodity or governments that reach consensus to restrict output and exports of a commodity with the aim of maximising profits. Dumping is the export of a commodity abroad at below cost or being sold at a lower price than in the domestic market. Export subsidies are the granting of tax relief and subsidised loans to the nation's exporters or the granting of low-interest loans to foreign buyers in a bid to stimulate the nation's exports (Salvatore, 2016).

Other more administrative and technical classes of restrictions include local content requirements, rules of origin, and government-procurement policies (Yarbrough and Yarbrough, 2011). The local content requirements restriction stipulates that in order for a good to be sold in a domestic market it has to have a specified percentage of a product's inputs produced locally. Maponga and Musa (2020) notes the recent generation of mining and industrial policies in most resource-rich developing countries moving towards local content requirements in order to ensure that minerals value chain are linked to domestic economy. Rules of origin are important to prevent non-member countries from circumventing the tariffs in one country by exporting their goods through another country who is a member of the trading bloc. As countries are members of certain economic zones and free trade areas, listed below are different types of trade areas (Baylis *et al.*, 2017):

- A free trade area is the form of economic integration wherein all barriers are removed on trade among members and some former members, but each nation retains its own barriers to trade with non-members;
- A custom union allows no tariffs or other barriers on trade among members, an example is a free trade area. The union also harmonises trade policies, such as setting common tariff rates;



- A common market goes beyond a customs union and in addition allows the free movement of labour and capital among member nations; and
- An economic union is the most advanced type of economic integration. It goes further than a common market by harmonising and unifying monetary and fiscal policies of member states.

Governments also play a pivotal role in the procurement and selling of goods and services directly in the international markets or through their state-owned entities. However, most countries have buy-domestic requirements, which mandate governments to purchase goods that are produced domestically on a preferential basis (Yarbrough and Yarbrough, 2011).

#### **2.4.4 Tariff Protection in Natural Resources**

According to Salvatore (2016), most countries use import tariffs to protect their markets and industries, but this practice discourages the undertaking of processing activities in countries where raw materials originate. Countries also use import tariffs to extract rent from a resource exporting country (World Trade Organization, 2010b). Although developed countries seem to be committed to liberalisation of trade under the WTO, the unfortunate part is that many commodities and goods from developing countries are effectively rendered uncompetitive in markets of developed countries by unfair practices and regulations (Melber, 2010).

Tariff protection in the natural resources sector has decreased significantly over the years, especially after the inception of the WTO after the Uruguay Round. Tariff protection in the natural resources is low relative to overall merchandise trade, however, tariff escalation is significant in natural resources. This is where high duties are imposed on materials in their processed form compared to their raw state (Latina *et al.*, 2011). In many

instances developed countries will import input raw materials duty-free or impose a low tariff rate compared to the final products (Figure 8). This is done to encourage domestic processing and employment (Salvatore, 2016).

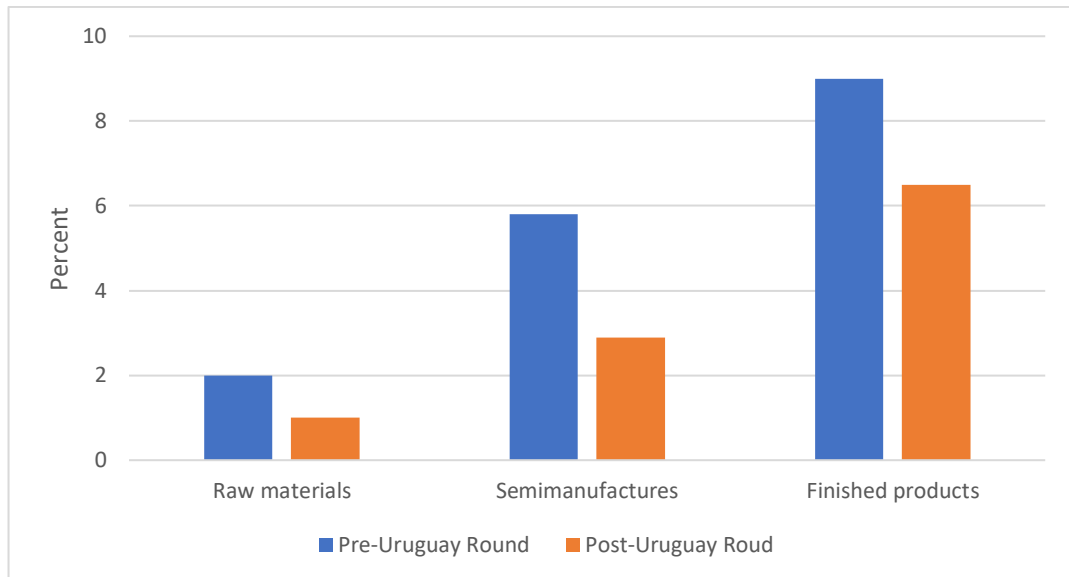


Figure 8: Rising Tariff Rates with Degree of Processing in Developed Countries

Source:(Salvatore, 2016)

Davis and Tilton (2005), also mention that the structure of tariffs and other barriers to mineral trade imposed by developed countries discriminate against the more processed mineral commodities. They suggested that changes in trade policies of importing countries could assist mineral-producing countries to diversify their economies.

#### 2.4.5 Arguments for Trade Restrictions

Some countries have an abundance in natural resources and others have a scarcity, such that they import nearly all their natural resources. It is in this context that you would find countries imposing trade restrictions in a bid to manage disproportionate impact on exports or imports (World Trade Organization, 2010b).

There are special circumstances where trade restrictions are justified to protect domestic industries without being reciprocated, such as in the instance of supporting an infant-industry. A nation may have a potential to produce a particular commodity, in which it has a comparative advantage, but because of the lack of technical ability and initial small level output, the industry might not be set up or would not be able to compete successfully with established foreign firms (Salvatore, 2016). In such exceptional circumstances it is justified to use temporary trade protection to protect the domestic industry during its infancy stage, until such time it can compete and achieve economies of scale.

The infancy protection argument is more relevant in developing countries than in developed countries. Proponents for the infant-industry argument acknowledge that temporary trade restrictions might cause welfare losses in the developing country. Khan (2013) states that protecting domestic markets in developing countries through trade restrictions can provide infant industries with loss financing to engage in production and learning-by-doing. However, he cautions that if competitiveness does not catch-up with the protection of infant industries, these strategies become unsustainable and just accumulate subsidy costs. Developed countries got rich because for a prolonged period of time their governments subsidised and protected dynamic industries and services in their infancy stages (Reinert, 2007). Most of these countries emulated the prosperous ones at the time by bringing their productive capacities into areas where technological change was being directed, in a process generating rents, which are returns above normal income. The benefits that accrued from the successful implementation of this system is that the rents are distributed to business in the form of profits, to labour in the form of higher wages, and to government through higher taxes (ibid).

Critics of the infant industry argument point out that historically it has proven to be difficult to discontinue protection even after the protected industry can

now compete successfully. Salvatore (2016), further mentions that it may be difficult to identify which industries qualify for protection and cautions that once protection has been granted industries may become very reluctant to relinquish the privilege, which in the long-run will lead to production inefficiencies and disadvantage consumers. In general trade protection harms the consumers and benefits the producers. The local producers would still want to maximise their profit margins at the expense of domestic consumers and foreign producers (Yarbrough and Yarbrough, 2011).

Governments play a critical role in financing infant industries strategies and implementation of strategic trade policy (Khan, 2013). It is therefore incumbent on government to assist domestic firms in these industries to capture large enough markets to allow them to move down their learning curve by imposing import restrictions and reserving the domestic market for domestic firms. However, Tregenna (2015a) notes that industrial policy alone is not sufficient to develop a strong manufacturing domestic sector, supportive macroeconomic policy is also necessary.

Friedrich List in Reinert (2007) argued that free trade had to be brought about slowly and systematically to avoid making poor countries poorer. Developed countries used tariff protection mechanisms to grow their economies. Countries that apply free trade now did not use it during the infancy stages of their industries. Instead, they applied for tariff protection against developed countries on goods of a similar nature that they produced. According to Reinert (2007), protection for manufacturing is considered no longer necessary when the domestic market reaches a state of preferring local industry over foreign industry, resulting in import substitution. The market then takes over the role that was played by protectionist policies in what Adam Smith called the invisible hand.

## 2.5 History of Trade Policy and Liberalisation

Towards the end of the Second World War governments reached an agreement in opening domestic economies in order to re-establish international trade and investment flows, to aid post-war recovery (Baylis *et al.*, 2017). In order to sustain the stability of the new world economic order, Baylis *et al.* (2017), further state that it was necessary for governments to create institutional structures that oversaw and facilitated issues pertaining to international relations and trade as part of the post-war commitments. This was characterised by the creation of Bretton Woods institutions, viz., the International Monetary Fund (IMF), the World Bank and the General Agreement on Tariffs and Trade (GATT), which later became the World Trade Organization (WTO). The Bretton Woods Conference took place in 1944 in New Hampshire, USA and was organised by the Western world following the economic melt-down of the 1930s (Kugler, 2016). After the Great Depression of the 1930s, John Maynard Keynes' new economic theory suggested that it was global output rather than prices that adjusted to global imbalances in trade (Baylis *et al.*, 2017). He also advocated for countries to specialise in the areas of their comparative advantage, suggesting that they would be able to raise their living standards through trading their surplus specialised production on the open market.

In order to stabilise global trade and prevent political history from repeating itself, Maynard also proposed a creation of a multilateral institution, which was later called the International Trade Organization (ITO), that would facilitate the continual expansion of global trade (Das, 2007). However, the establishment of the ITO was abandoned following lack of support from the US, which deemed the institution's regulation as too interventionist. Instead, GATT was established in 1947 following a United Nations Conference of Trade and Employment that developed a Charter on Trade in Havana (World Trade Organization, 2017). GATT served as an ad hoc international organisation for 47 years, executing some functions originally intended for

the ITO. Subsequently, the World Trade Organisation (WTO) was established in 1995, following a series of negotiations for multilateral trade between countries (Baldwin, 2016). Initially, countries had high tariffs and the introduction of the multilateral framework of international trade helped to bring down the tariffs over the years as a necessary step for development and growth (Yarbrough and Yarbrough, 2011). Table 3 below shows a sequence of negotiation rounds for multilateral trade and the reduction of tariffs for the period 1934 to 2001.

Table 3: Tariffs Reduction, 1934 – 2001

GATT/WTO Conference	Average Cut in All Duties	Remaining Duties as Proportion of 1930 Tariffs	Number of Participants
Pre-GATT (1934 - 1947)	33.2%	66.8%	23
First Round (Geneva, 1947)	21.1%	52.7%	23
Second Round (Annecy, 1949)	1.9%	51.7%	13
Third Round (Torquay, 1950 -1951)	3.0%	50.1%	38
Fourth Round (Geneva, 1955 -1956)	3.5%	48.9%	26
Dillon Round (Geneva, 1961 -1962)	2.4%	47.7%	26
Kennedy Round (Geneva, 1961 - 1962)	36.0%	30.5%	62
Tokyo Round (Geneva, 1974 -1979)	29.6%	21.2%	99
Uruguay Round (1987 - 1994)	38.0%	13.1%	125
Doha Round (Geneva, 2001 -)	na	na	144

Source:(Yarbrough and Yarbrough, 2011)

- Annecy Round (1948) – The first round of negotiations under GATT supervision was with a total of 23 member states, called "contracting parties", and 10 more countries signed the General Agreement. The countries agreed to 5 000 tariff concessions (World Trade Organization, 2017) (Reuters, 1993).

- Torquay Round (1950) – 38 GATT members exchanged 8 700 tariff concessions yielding reductions of about 25 percent from 1948 levels (Reuters, 1993).
- Geneva Round (1956) – Concluded by 26 countries and it resulted in a US\$2.5 billion worth of tariff reductions (Reuters, 1993).
- Dillon Round (1960-1) – The round focused on harmonising concessions within the new European Economic Community and it involved 26 countries. It concluded in July 1962 with about 4 400 tariff concessions covering US\$4.9 billion of trade (Reuters, 1993).
- Kennedy Round (1964-7) – The Kennedy Round resulted in an agreement to cut average tariff rates on industrial products by a total of 35 percent compared to the 1962 level, phased over five years, with participating countries representing 75 percent of total world trade (Reuters, 1993). Average tariff rates on industrial products in industrial nations were less than 10 percent by the end of 1972. However, many nontariff trade barriers still existed in other sectors especially in agriculture (Salvatore, 2016). The value of concessions covered by trade was estimated at US\$40 billion (Reuters, 1993).
- Tokyo Round (1973-79) – The Tokyo Round was concluded in 1979 and promoted further cuts in negotiated tariff agreements, phased over eight years starting from 1980 (Reuters, 1993). The round involved 102 countries, which established a code of conduct to reduce the restrictive effect of nontariff barriers, which covered the agreement on government procurement, the uniformity in application of duties and a Generalised System of Preference (GSP) to manufactured, semi-manufactured and selected exports from developing countries (World Trade Organization, 2017). However, products deemed to be of great importance to

developing countries such as textiles, shoes, consumer electronics and steel were excluded (Salvatore, 2016). Trade concessions were estimated to have covered more than US\$300 billion (Reuters, 1993).

- Uruguay Round (1986-94) – The Uruguay Round agreement was signed by 115 countries in 1994 and took effect in 1995 (Reuters, 1993). The major provisions of the accord were to further reduce tariffs on industrial products and quotas on agricultural products (Salvatore, 2016). The accord provided quicker mechanisms to deal with disputes arising from dumping practices. Government subsidies for industrial research was limited to 50 percent of the research cost. Nations could temporarily raise tariffs if there was a surge in imports that harmed the domestic industry (Salvatore, 2016). The accord also resolved for GATT secretariat to be replaced with the World Trade Organization (WTO) extending its authority into agricultural products and services. Furthermore, the accord provided for a 20-year protection of patents, copyright and trademarks (Salvatore, 2016). Trade disputes could be settled by two-thirds majority, no longer by unanimous decision as was stipulated in GATT. It is estimated that world welfare increased by US\$73 billion in 2005 following the implementation of the Uruguay Round with US\$58.3 billion, about 74 percent of the gains going to developed countries and US\$19.2 billion to developing countries (Salvatore, 2016).
- Doha Round (2001- ) – The Doha round was launched in 2001 by the WTO with the aim to further liberalise production and trade in agricultural products, industrial products and services. The Round was also intended to tighten anti-dumping laws and competition policies. The accord was supposed to have been concluded in 2004, but negotiations collapsed in 2006 (Salvatore, 2016).



### **2.5.1 The General Agreement on Tariffs and Trade (GATT) (1947)**

GATT was created in 1947 by 23 countries and headquartered in Geneva to promote free trade through multilateral trade negotiations (Reuters, 1993). Initially, GATT focused on international trade of goods, but this later incorporated international trade in services and international movement of capital (Trebilcock and Prado, 2011). GATT rested on three basic principles, viz., non-discrimination, elimination of nontariff barriers such as quotas and consultation among nations in solving trade disputes within the GATT framework. The non-discrimination principle referred to unconditional acceptance of the most-favoured-nation principle and reciprocity of tariff reductions, which stipulates that any tariff reduction offered to one nation by another should also be extended to other member countries.

Tariffs under the umbrella of GATT were reduced by a total of about 35 percent in trade negotiations that took place between 1947 and 1962. Preferential trade treatments were extended by GATT to developing countries in 1965 to allow them to benefit from tariff reductions without reciprocity to industrial nations (Salvatore, 2016). Preferential trade agreements provide lower trade barriers among member countries compared to non-member nations.

Greater tariff reductions were not yet achieved before 1962 because most developed countries such as the United States attached protectionist devices to negotiating down tariffs. This included the argument of causing harm to the domestic industry or hurt industries important for national defence, any domestic industry could claim injury from imports, which could lead to the revoke of any negotiated tariff agreements (Salvatore, 2016).

## **2.5.2 World Trade Organisation (WTO) (1995)**

The WTO formally succeeded GATT in 1995 as a multilateral institution to deal with free trade norms in international law to create a level playing field for import/export activities. The objective of the WTO is to provide fair and uniform rules for international trade and protect local producers against dumping of products and subsidies from other member states, which are considered an unfair trade practice (World Trade Organization, 2019). The WTO provides a framework for international trade for both goods and services, and the protection of intellectual property rights (Das, 2007). However, developing countries have struggled to play an effective role in this regime as multilateral trade negotiations have become increasingly complex and protracted (Trebilcock and Prado, 2011).

The WTO has a sophisticated Dispute Settlement System for adjudicating formal disputes between member countries. In most instances many smaller and poorer developing countries would not use the Dispute Settlement System to raise unfair trade within their jurisdictions, because of expensive litigation processes and fear of victimisation by developed countries since most rely on aid or preferential treatment from them (Limenta, 2014). These power constraints create asymmetries between developing countries and developed countries. Another factor, why most developing countries do not initiate complaints in the Dispute Settlement Mechanism is because of low volumes of their trade owing to less diversified economies (Trebilcock and Prado, 2011). However, developing countries need to start participating more in Dispute Settlements in order to reshape international trade law and jurisprudence that will govern multilateral trade relations for years to come (Limenta, 2014).

Conventional economic consensus suggested that a liberal world trading system would be beneficial to all countries and would lift developing countries from their impoverished conditions (Trebilcock and Prado, 2011).

However, over the years, the WTO has been accused of focusing more on the needs of the most powerful members and less effort is being made to ensure that developing countries also meaningfully benefit from the potential gains of trade (Baylis *et al.*, 2017). As a result many developing countries started to become discontented towards the trading regime.

Baylis *et al.* (2017), further state that the WTO has proved to be effective at removing government subsidies, but unfortunately the level playing fields do not seem to apply to all areas. Salvatore (2016), also points out that most developed countries have been reluctant to expose their primary industry such as agriculture to direct competition from low-cost developing countries' producers by continuing to subsidise businesses in these sectors. This is in contrast with the WTO regulations and the notion that countries should specialise in their areas of comparative advantage especially when it comes to natural resources. The former Director-General of the WTO in the World Trade Report 2010, conceded that many of the organisation's rules impinge on natural resources trade as they did not cover all aspects of current policy realities (World Trade Organization, 2010b). Baldwin (2016), notes that the WTO seems frozen in time with the last major trade liberalisation done in 1994.

It is perceived that since 1990 the World Trade Organization trade negotiations have resulted in some unfair treaties between developed and developing countries (Reinert, 2007). Developing countries find themselves not competing on the same footing with developed countries, based on some of these subsidies and tariff structures. The imperfect complex structure of subsidies and tariffs end up relegating participation of developing countries in the multilateral systems to that of depending on aid (Yarbrough and Yarbrough, 2011).

## 2.6 Industrial Policies

Most developing countries during the 1950s – 1970s made a deliberate attempt to industrialise instead of continuing on a downward spiral of exclusively specialising in their primary goods as suggested by traditional trade theory. Salvatore (2016), mentions that industrialisation is expected to provide the following benefits:

- faster technological progress;
- the creation of high-paying jobs to address unemployment and underemployment in developing countries;
- effectively use backward and forward linkages in the production process to provide high multipliers and accelerators;
- improve the terms of trade and maintain stable export prices and earnings; and
- provide relief on the balance of payments given the fact that demand for manufactured goods by developing countries rises faster than their export earnings.

Industrialisation can materialise in two forms, either through import-substitution industrialisation (ISI) or export-oriented industrialisation (EOI) - both policies have advantages and disadvantages (Table 4). Historically industrialisation and the concept of import-substitution have rapidly increased employment and wages, which had the ability to offset the high cost of manufactured goods in developed countries (Reinert, 2007). This concept was at the core of America's economic theory around 1820 and seem to be counter-intuitive and contrary to historical experience to expect that greater openness would improve a lot of poor countries (Reinert, 2007). As a matter of fact, openness has killed the little manufacturing activity that existed in many poor countries, driving them to deindustrialisation and primitivisation.

Table 4: Import-Substitution Industrialisation (ISI) vs Export-Oriented Industrialisation (EOI)

Advantages	Disadvantages
<b><i>Import-Substitution Industrialisation</i></b>	
The market for the industrial product already exists – low risk of market entry	Domestic companies have no incentive to become efficient as they grow used to protection
It is easier for developing countries to protect their local markets through tariffs against foreign markets	The small markets of developing countries can lead to inefficiencies and prevent them to exploit economies of scale
Foreign companies are induced to establish tariff-factories in order to overcome tariff restrictions and participate in the domestic market	Import substitution over time becomes more costly and expensive as more capital-intensive and technological advanced import products have to be replaced with domestic manufactured goods.
<b><i>Export-Oriented Industrialisation</i></b>	
Overcomes the smallness of the domestic market in developing countries and exploit the economies of scale	Difficult for developing countries to set-up industries because of competition from more established industries in developed countries
Production of manufactured goods creates efficiencies throughout the economy	Developed countries tended to provide high level of effective protection for their industries
Expansion of manufactured exports are not limited by growth of the domestic market	

Source: Adapted from (Salvatore, 2016)

According to Salvatore (2016), most developed countries, especially the larger ones during the 1950s – 1970s, adopted import-substitution policies and protected their infant industries with effective tariffs that rose with the degree of processing. Very high effective rates of protection were levied by many developing countries during this period, which produced little success and led to inefficient domestic industries in countries such as India, Argentina and Nigeria (ibid). Focusing solely on industrialisation through

import-substitution also posed the risk of countries neglecting the agricultural sector and other traditional primary sectors. Countries such as Hong Kong, Korea and Singapore are reported to have focused on export-oriented strategies during the same period and performed fairly well compared to their counterparts (Salvatore, 2016). However, Salvatore (2016), points out that import-substitution policy might be quite beneficial in the early stages of development of a country, while export-oriented policy will be necessary later in the development process. Many African countries post-colonial rule attempted inward industrialisation as a strategy for accumulation of wealth for their economies, but this failed to address the structural weaknesses inherited by their States (Satgar, 2010). According to Mkandawire in Southall and Melber (2010) the import substitution industrialisation phase in most African countries was too short to have any notable effect.

In South Africa, the National Industrial Policy Framework (NIPF) was approved by Cabinet in January 2007 and its first implementation blueprint: the Industrial Policy Action Plan (IPAP) in August 2007 (Department of Trade and Industry, 2007). The NIPF rejected a 'one size fits all policy approach', recognising that South Africa cannot rely heavily on either consumption or commodities as the basis for growth and development, in contrast to the economic ideology proposed by the Washington Consensus (Zalk, 2014). Post-World War II, brought together three interantional financial institutions viz., IMF, World Bank and WTO to the international political environments. According to Williamson in Jarso (2018), these institutions advocated for liberal reforms adopted from western economic ideology, otherwise known as the Washington Consensus, which supported fiscal discipline, tax reforms, trade liberalisation by government and privatisation of state enterprises.

The industrial structures of developing countries that have uncritically followed the Washington Consensus, have mimicked those during colonial

era with some countries exporting raw materials and importing industrial goods, and advanced services in a new neo-colonialism era (Department of Trade and Industry, 2007). The result of this is witnessed in the map of trade with the division of Africa into a complex network of different trade agreements with the objective to benefit the developed countries (Reinert, 2007).

The outcome of these trade agreements has led to a situation where it has become difficult for African countries to trade among themselves in the kind of trade they really need. However, this is expected to change following the establishment of the African Continental Free Trade Area (AfCFTA) agreement. The agreement entered into force on 30 May 2019 after 24 countries had deposited their instruments of ratification (African Union, 2019). On 7 July 2019 at an Extraordinary Summit of the African Union, the operational phase of the AfCFTA agreement was officially launched, with trade expected to begin on 01 July 2020. The expected date of trade will likely be postponed as the world battles with containing the novel coronavirus, which gave rise to the COVID-19 disease. The disease, which was reported to have emanated from Wuhan province in China, has led to many countries closing down their borders in a bid to contain the spread of transmission. Unfortunately these measures, as necessary as they are, have also affected international trade and economic activity.



## **2.7 Beneficiation and Economic Diversification**

Mineral beneficiation can be defined as any further processing of a mineral beyond the stage where it represents a saleable raw material (Robinson and Von Below, 1990). In South Africa's Minerals Policy White Paper(1998, p.28), beneficiation is described as *"the successive processes of adding value to raw materials from their extraction through to the sale of finished products to consumers, covers a wide range of very different activities"*. The term beneficiation in South Africa's Beneficiation Strategy document is

described as the transformation of a mineral to a higher-value product, which can either be consumed locally or exported (Department of Mineral Resources, 2011). However, Baxter (2013), points out that it is very important to make the distinction between mining beneficiation and manufacturing beneficiation. He mentions that manufacturing beneficiation is driven by competitive advantage issues such as operational costs, productivity and skills, and not necessarily by comparative advantage and the availability of raw materials (Table 5).



Table 5: Comparative Advantage versus Competitive Advantage

Type of advantage	Source	Beneficiary	Description and policy implication	
<b>Comparative advantage as traditionally defined</b>	Endowed	All firms in industries, regions	Cheap resources, low cost labour. Endowed advantages remain critically important to South Africa's primary industries. Microeconomic reforms that improve the country's ports, transport and electricity will support the country's comparative advantages in these areas.	<b>Primary industries</b> 
<b>Dynamic comparative advantage</b>	Created	All firms in industries, regions	World class human and physical infrastructure, as well as clusters that develop capacities useful to all firms. Here South Africa is weak and policy objectives should be on the enhancing of physical infrastructure, a better educated and skilled workforce, market reforms, support for R&D, etc.	
<b>Competitive advantage</b>	Created	Individual firms	The fostering and nurturing of world class firms. Policy issues here include competition law responses to the need for scale in global markets, tax regimes relative to competitors, domestic non-nontariff barriers, government procurement, overseas market development support, export facilitation, etc.	<b>Competitive Manufacturing</b>

Source: (Baxter, 2013)

The path to development and economic growth for nations is through education and increasing human capital, which must be matched with an increasing demand for skilled labour domestically (Davis, 2010). Most industrial nations grew with advances in production technology, leading to higher skill levels and accumulation of capital, while developing countries where the mineral resources were extracted lagged in development (Dickens, 1988). Reinert (2007), further identified that what is normally termed development is actually knowledge-based and technology-based rent, which is reinforced by free trade instead of being reduced between nations at very different levels of development. Trade by nations at different levels of development often resulted in developed countries specialising in manufactured goods while developing countries were encouraged to follow their comparative advantage by specialising in raw materials. This made it difficult for developing countries to play catch up and emulate the same developmental path that developed countries followed.

Post-World War II, Europe's industry was lagging that of the US, but nobody suggested that they should follow their comparative advantage in agriculture. As a matter of fact, everything was done to re-industrialise Europe through the Marshall Plan by protecting manufacturing industries (Reinert, 2007). Most successful developing countries, especially in Asia, such as China and India, have followed the recommendations of the Marshall Plan rather than those of the Washington Consensus.

Primary natural resources, such as agricultural goods and minerals, have been the key driver of economic development in Africa. However, the lack of economic diversification and dependence on mineral resource commodities has put most of the states on the continent in a vulnerable position as mineral commodities are subjected to wide price fluctuations. Africa's great potential is often unrealised because of a failure to use the gains derived from exploitation of mineral resources to further other

economic activities, thereby broadening its economic base (OECD/United Nations, 2011).

There are contrasting views on whether African countries should be pursuing diversification of their economies or maintaining the current production practice of relying on primary commodities. Economists grounded in neo-classical economic theory believe countries are better off producing whatever is their comparative advantage instead of diversifying out of primary commodities into manufacturing. Hausmann *et al* (2008) mention that forward linkages play a small role when compared to traditional determinants of comparative advantage and that the perceived cost savings of local processing of raw materials is not a justification for forward linkage-based policies. Hidalgo *et al* (2011), argue that diversifying an economy is not an easy task and the current exports of a country will determine how seamless it will be for an economy to transition from producing primary products into manufactured goods. However, Rodrik (2009), has argued that for economic growth to take place, countries have to industrialise, and this requires government intervention through proactive industrial policies. He further states that deliberate policy-induced diversification out of primary products into manufacturing is justified since a persistent commodity boom could crowd out manufacturing.

The issue of natural resource governance has gained greater currency in recent years with adoption of continental frameworks such as the Africa Mining Vision, representing a shift by developing countries, moving away from dependence on mineral extraction economies, towards sustainable usage of minerals and promotion of diversified economies (African Union, 2009). Therefore, sound mineral extraction policies and governance by developing countries is important, because sometimes it is failure in governance by the State that leads to excessive depletion of natural resources (Frankel, 2012). Ascension to oversight bodies such as the Extractive Industry Transparency Initiative (EITI), could also be deemed a

necessary move for developing countries to assist them to mainstream governance best practices to improve their mineral resources policies, auditing, establish appropriate institutional, legal and regulatory frameworks (African Union, 2009). The EITI is the global standard to promote the open and accountable management of oil, gas and mineral resources.

Advancing mineral beneficiation in developing countries has the potential to encourage resource-based economies to transition to knowledge-based economies as the world moves to an era of the fourth industrial revolution (Bhengu, 2015). Beneficiation also has the potential to create economic linkages which manifest themselves through economic multipliers (Figure 9). This will ensure that there is continuation of economic progress long after the resources have been depleted. Jourdan (2014, p.110) argues that developing countries such South Africa “...has a comparative advantage in establishing resource linkages industrial clusters through the immediate market offered by the local and regional resource industries demand for inputs”. He further mentions that the market for inputs such as consumables, services, plant and equipment can ameliorate the economies of scale constraints through demand provided by specialised resources industries.

The problem in most developing economies is that linkages are not well established, leading to developing countries exporting the bulk of their natural resources in raw form to international markets instead of intermediate or finished products. The danger for developing countries specialising in the production of raw materials and not advancing their industrial sectors is that developed countries can at any given point decide to subsidise their primary sectors, as has been the case with the agricultural sector in many countries. No country without a developed industrial sector has ever been able to raise the wage level of its farmers (Reinert, 2007).

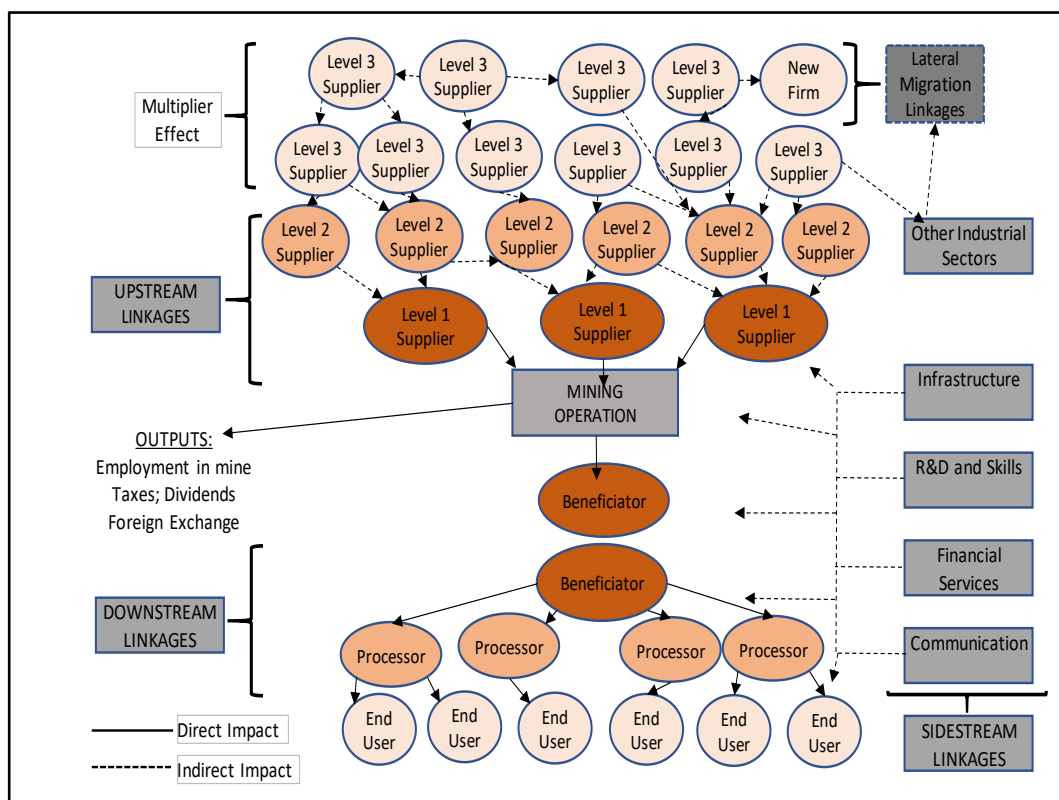


Figure 9: Extractive Industry Upstream, Downstream and Sidestream Linkages

Source: (Besada, 2016)

In as much as there is a strong drive for developing countries to benefitiate their raw minerals, few have internal markets large enough to justify the establishment of manufacturing enterprises on a scale that can make them economic. However, Reinert (2007), states that diversifying the economy from dependence on raw materials production is important even when initially the new sectors will be unable to face global market competition. Regional integration may play an important role in consolidating local market demand to justify the case for beneficiation and product diversification.

Although domestic markets play an important role in the promotion of beneficiation by providing a secure outlet for sales, the development of technology and marketing know-how is equally important to give a country a competitive advantage required to penetrate export markets (World Trade

Organization, 2013). Robinson and Von Below (1990), have cited the following aspects under the localisation theory as prerequisites that will encourage beneficiation of raw materials to take place in the local market: production cost advantages, locational interdependence of firms, and the existence of a consumer market at a specific location that attracts production facilities. The use of the locational advantage of producing crude resources to establish resource-processing industries could then provide the feedstock for manufacturing and industrialisation (African Union, 2009). The National Planning Commission of South Africa (2012) also stated that first stage beneficiation should be prioritised in areas where capacity already exists and beneficiation is likely to lead to downstream manufacturing.

The African Union (2009), suggested that Africa's resources should be used to catalyse industrial development in the continent by building integrated resource industrial clusters and the development of high-level skills, investment into Human Resource Development (HRD) and Research and Development (R&D) (Figure 10). However, Reinert (2007), points out that most developing countries specialise in activities subject to diminishing returns, which does not raise their wage levels. They have no control over prices and technological changes, they are either lacking in learning potential and/ or the fruits of learning are passed to customers in rich countries in the form of lower prices rather than creating local wealth.

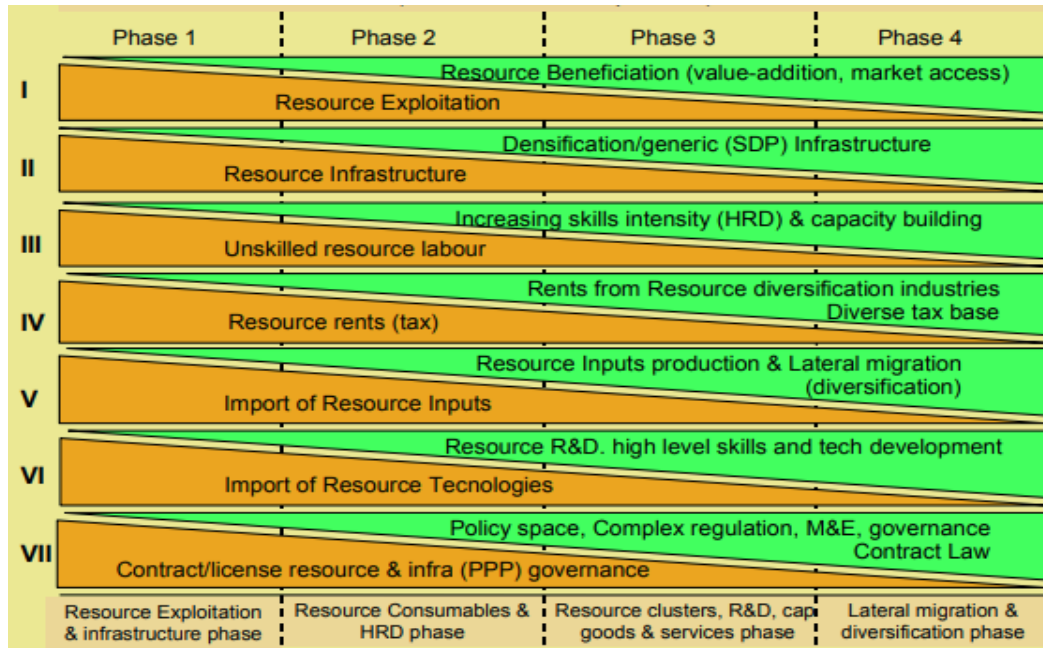


Figure 10: Schematic Resource-Based African Industrialisation Phasing

Source: (*Africa Mining Vision, 2009*)

Resource-based industrialisation has many layered aspects and would naturally go through four phases as depicted in Figure 10. Phase I is the resource extraction stage with minimum processing and the bulk of inputs being imported (Jourdan, 2014). Phase II is the resource processing and export phase with increasing production engineering services and high affinity for lower-technology imported input materials that can easily be substituted (ibid). Phase III is the initial export of some goods and services, and resources are processed into higher value added products. In this phase engineering services tend to be based on local intellectual property. Phase IV is predominantly based on exports of a greater variety of resource-based products and the migration into resource-independent sectors and knowledge-based industries.

Figure 11 shows that there is increase in product complexity and sophistication once you move along the value addition chain. The value of products increases, which means increased scope for governments to generate revenue through taxes, and there are more stable jobs down the

value chain. There is also less variability downstream in terms of market shocks.

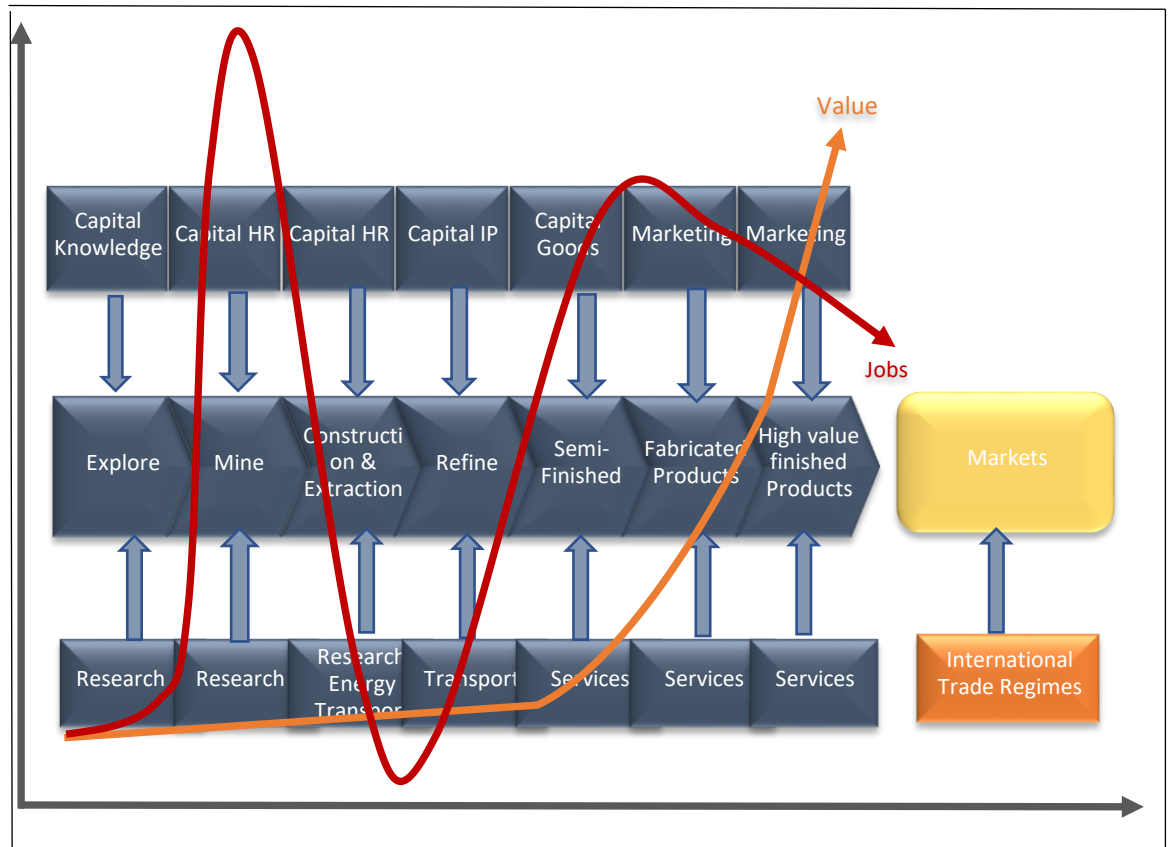


Figure 11: Mineral Beneficiation along the Value Chain

Source: Adapted from (Mtegha, 2018)

From the chapter there is a case why developing countries rich in mineral resources should beneficiate their raw minerals instead of exporting them in their raw state. The focus of this report is mainly on international trade regimes as an impediment to market access, resource exploitation and beneficiation.



## 2.8 Chapter Summary

Over the years there have been many economic trade theories. This chapter looked at literature on the trade theories and the impacts of protectionism and restriction policies on the flow of trade of commodities. The chapter further assessed the progress on history of trade negotiations since the inception of GATT/WTO. The chapter lays a solid foundation on different concepts of trade, highlighting economic diversification as an important aspect of economic growth.

As much as globalisation has led to an increase in global flow of trade and finance, most of the hotspots and development of globalisation are concentrated in industrialised nations. This begs the question why many developing countries remain largely as bystanders in the new economic order, and if developing countries will ever be able to compete with developed countries under the current liberal economic regime. Reinert (2007) argued that free trade had to be brought about slowly and systematically to avoid making poor countries poorer by expecting them to compete at the same level as developed countries. Developed countries used tariff protection mechanisms to grow their economies, countries that apply free trade now did not use it during the infancy stages of their industries instead they applied for tariff protection against developed countries on goods of a similar nature that they produced.

Emulation and the learning-by-doing concept were also highlighted as possible key drivers for development in the chapter. Unfortunately a lot of developing countries do not follow this practice and are forced into a poverty trap. Trade by nations at different levels of development often resulted in developed countries specialising in manufactured goods while developing countries were encouraged to follow their comparative advantage by specialising in raw materials. This made it difficult for developing countries

to play catch up and emulate the same developmental path that developed countries followed.

The same institutionalised economic structure during the colonial era still persists in modern day, where developing countries still export their primary mineral products to developed countries for further value addition. In this process, it was established that economic development tends to become one sided with high growth being created around developed countries and those with diminishing returns in developing countries.

The chapter further pointed out that it was becoming more apparent that developed countries were protecting their local industries under the pretext of declaring certain minerals as strategic and aggressively ensuring the security of supply of such minerals at all cost. Certain countries have been accumulating inventory stocks of such minerals leading to a rapid depletion of these minerals in some developing countries, leaving little chance for them to be beneficiated in the mineral-producing countries.

Despite successive rounds of multilateral trade liberalisation some trade barriers still remain highly restrictive. Tariff escalation is significant in natural resources where high duties are imposed on materials in their processed form compared to their raw state. It is mentioned that developed countries imported input raw materials duty free in most instances or imposed a low tariff rate compared to the final products to promote processing in their countries, which ultimately inhibited developing countries from diversifying their economies

In as much as there is a strong drive for developing countries to beneficiate their raw minerals, few have internal markets large enough to justify the establishment of manufacturing enterprises on a scale that can make them economic. This is where regional integration may play an important role in consolidating local market demand to justify the case for beneficiation and

product diversification. Another problem in most developing economies is that linkages are not well established, leading to developing countries exporting the bulk of their natural resources in raw form to international markets instead of high intermediate finished products.

Beneficiation of minerals is stated as the bedrock for advancement of resource-rich countries and information from this chapter is used and contrasted with primary data obtained from different world integrated trade systems in chapters to follow. The next chapter defines the methodology used to conduct this research.

## **CHAPTER 3: RESEARCH METHODOLOGY**

### **3.1 Introduction**

This chapter presents the research methodology used in this study. It begins by detailing the data used in the research and its sources. The chapter then outlines the research design that will be used to assess the level at which import tariffs are charged on benefited goods, and the effects of Preferential Trade Agreements (PTAs). Since the study required the assessment of commodities using a six-digit level Harmonised Commodity Description and Coding System (HS), it was decided to use the partial equilibrium model for a more focused analysis, by using the Single Market Partial Equilibrium Tool (SMART) from the World Bank. The SMART modelling tool was used because it allows for analysis at disaggregated level and caters for comparison between different databases.

Some trade barriers still remain highly restrictive to many developing countries despite successive rounds of multilateral trade liberalisation. Tariff escalation on processed goods imposed by developed countries remain a major factor for developing countries even post the Uruguay trade negotiations round, hindering export growth, diversification and sustainable development in developing countries (Thomas and Trachtman, 2009).

The assessment will be based on investigating the effect of PTAs on mineral trade and whether the GSP system makes a difference in changing the structure of mineral trade, or if it exacerbates the current export of raw materials. Tariff preferences for developing countries were introduced in the 1960s. This was done in a bid to address the equality gap between developed countries and developing countries. However, developing countries had claimed that the Most Favoured Nation (MFN) tariff system was creating a disincentive for richer countries to speed up the elimination

of tariffs and trade restrictions to benefit developing countries (UNCTAD, 2015).

GSP is a generalised, non-discriminatory and non-reciprocal preferential tariff system imposed by a nation to various countries deemed to be in developmental stages. GSP is different from MFN in that a nation does not have to extend the same favourable conditions to other recipients (World Trade Organization, 2017).

### **3.2 Data Collection and Data Sources**

Import tariffs and trade flow datasets were sourced from the World Integrated Trade System database of the World Bank. The integrated database and software allows users to access and retrieve information on trade and tariffs from a list of international organisations, namely:

- United Nations Statistics Division Commodity Trade (UN Comtrade) – the database contains commodity trade exports and imports recorded according to internationally recognised tariff classifications
- United Nations Conference on Trade and Development Trade Analysis Information System (TRAINS) – the database covers information on tariff and non-tariff measures recorded at HS level and national tariff line level. The tariff rate information includes various preferential regimes, viz., GSPs, PTAs, Regional Trade Agreements (RTAs) and bilateral trade agreements.
- WTO's Integrated Database (IDB) – similar to TRAINS with the consolidated tariff schedule containing WTO-bound tariffs, initial negotiating rights during concession negotiations by countries and other indicators.
- World Bank's Global Preferential Trade Agreements Database – provides information on PTAs world over including agreements that have not yet been notified to the WTO.

There are various standard nomenclatures used in the integrated database, which are internationally recognised classifications used for trade, tariff, and industry and national income accounts. For purposes of standardising the content, format and structure of outputs for analysis, the study used the HS system for external trade and tariff classification. For national income accounts, the study used the Broad Economic Categories (BEC) classification, which categorises trade statistics into large economic classes of commodities. Furthermore, policy documents and trade agreements available from the WTO were reviewed, particularly PTAs, to assess their impact on mineral trade on selected trading partners. For purposes of conducting a trend analysis and obtaining a representative sample, the datasets used for this study was for the period between 1<sup>st</sup> January 2015 and 31<sup>st</sup> December 2019.

### **3.3 Research Design**

A tariff and trade simulation will be conducted on selected developing countries using the World Bank's Single Market Partial Equilibrium Tool (SMART) to ascertain the effect of trade diversion. The modelling tool is used to anticipate the likely economic effects of different policy options (World Bank, 2011). The research will use the fluorspar industry as a case study in South Africa, in an attempt to make a case for domestic mineral beneficiation. This will be illustrated by examining the lost opportunity cost on the fluorspar value chain and how international trade regimes impact on the trade of value-added products and industrialisation in developing countries.

#### **3.3.1 Rationale for using the SMART Modelling Tool**

There are different market access analysis modelling tools, which vary in complexity. These include the Computable General Equilibrium (CGE), which require a lot of data and are sometimes difficult to run. Hallren and

Riker (2017), mention that CGE models are useful analytical tools to analyse the impact of policy changes for many different sectors, and provide an estimate assessment of the economy-wide effects. However, if impact of policy changes is focused on a single industry, in this case the fluorspar industry, then a smaller targeted industry-specific model, such as the Partial Equilibrium model, would be the right tool to use for assessment.

This study will use the SMART model because it provides a more focused approach to investigate the impact of multilateral trade reforms on the domestic and international markets. Furthermore, the benefit of using the SMART model is that it uses the World Integrated Trade System database. Even though the partial equilibrium model was identified as the appropriate tool for this study, it also has a number disadvantages that need to be noted (Table 6). By definition, partial equilibrium implies that the analysis considers the effects of policy action in markets that are directly affected and does not account for the economic interactions between the various markets (World Bank, 2011).

Table 6: Advantages and Disadvantages of Partial Equilibrium Modelling

Advantages	Disadvantages
Minimal data requirement	Neglects economy wide linkages
Analysis at a fairly disaggregated level	Sensitive to behavioral elasticities
More transparent and easy to implement	Not consistent with budget constraints
Capturing short and medium term effects	Does not capture long term effects
Capturing complicated policy mechanisms	

Source: (World Bank, 2011)

### 3.3.2 Assumptions and Geometric Exposition

The SMART model reports on the impact of any trade policy shock and effects on trade flows such as imports from different sources. Figure 12

depicts the adjustment process when the demand quantity of an imported product at a given price moves to three supply situations which differ only by type of elasticity. If imports are unrestricted, the equilibrium price will be determined by equalisation of import demands and export supply. If a tariff is imposed, a wedge will be driven between the price paid and that received, which will lead to a decline in volumes traded (Gilbert, 2017).



Figure 12: Adjustment of Demand with Varying Elasticity

Source: (World Bank, 2011)

The core assumption of the SMART model is the Armington assumption, which states that imports from different countries are imperfect substitutes. The SMART model assumes infinite export supply elasticity, which means the export supply curves are flat and the world prices of each variety are exogenously given (World Bank, 2011). In order to use the partial equilibrium model the parameters are calibrated to current data for the industry and the economic impact of the policy is calculated as the difference between the model's predictions for market prices and quantities after the policy change (Hallren and Riker, 2017). Furthermore, the economic impact is calculated as the baseline values of market prices and quantities before the policy change. Borrowing from Gilbert (2017), economic surplus in the context of this study is the benefit associated with trade, which includes the net benefit to consumers in the importing country,



the tariff revenue collected in the importing country, and the net benefit to producers in the exporting country.

### 3.3.3 Model Structure

Table 7 lists the data inputs and economic outcomes in the basic partial equilibrium model used to analyse trade policy. A further assumption is made that other supply and demand fundamentals remain constant.

Table 7: Elements of the SMART Model on the Impact of Tariffs

Data Inputs	Economic Outcomes
Trade value by exporting partner	Normalising world price
Tariff faced by each exporting partner	Change in the price of subject imports
Import demand elasticity	Change in the quantity of subject imports
Export supply elasticity	Change in the quantity of subject exports
Substitution elasticity within the industry	Elasticity is the same whatever the exporting partner
Tariff rates on subject imports	Tariff revenue change
	Trade effect

Source: (World Bank, 2011)

To operationalise the model, according to Gilbert (2017), import demand (M) can be described by:

$$M = \alpha_M PM^\epsilon \quad (3.1)$$

Where the parameter  $\alpha_M > 0$ , and  $\epsilon < 0$  are known as the elasticity of import demand and PM is the import price.

Similarly, export supply (X) can be described by:

$$X = \alpha_X PX^\eta \quad (3.2)$$

Where,  $\alpha_x > 0$ , and  $\eta > 0$  are the elasticity of export supply.  $\eta = \infty$ , in a small country's case and  $PX$  is the export price.

Gilbert (2017), further states that the equilibrium condition requires that the volume of imports always equals the volume of exports landed, that is:

$$X = M \quad (3.3)$$

Therefore, the tariff wedge between the import price and export price is given by:

$$PM = PX(1 + T/100) \quad (3.4)$$

Where  $T$  is the ad valorem tariff rate, expressed as a percentage.

Once the equilibrium prices and quantities have been determined, the components of economic surplus can also be established. Tariff revenue (TR) is given by:

$$TR = PX \times T/100 \times M \quad (3.5)$$

Therefore, the changes in the gains from exchange to the importing and exporting countries are:

$$\Delta WM = \int_{PM_0}^{PM_1} \alpha_M PM^\varepsilon dPM = \frac{\alpha_M}{\varepsilon + 1} (PM_0^{\varepsilon+1} - PM_1^{\varepsilon+1}) \quad (3.6)$$

$$\Delta WX = \int_{PX_1}^{PX_0} \alpha_X PX^\eta dPX = \frac{\alpha_X}{\eta + 1} (PX_1^{\eta+1} - PX_0^{\eta+1}) \quad (3.7)$$

### 3.4 Chapter Summary

This chapter presented the research methodology used in the study. It started by detailing how the data used in the research was going to be acquired. The chapter further described how the identified partial equilibrium model (SMART) will be used to assess the impacts of tariff escalation in processed mineral commodities. The next chapter looks at mineral trade flow analysis and research findings.

## CHAPTER 4: MINERAL TRADE FLOW ANALYSIS

### 4.1 Introduction

This chapter will present the results and analysis of primary data collected on the flow of global mineral trade and look at the effect of tariff escalation on developed and developing countries.

Trade in natural resources is characterised by high price volatility, and natural resources often represent a disproportionate share of gross domestic product (GDP) and exports of resource-rich countries (World Trade Organization, 2010b). The Organisation for Economic Co-operation and Development (OECD) defines natural resources as raw materials occurring in nature that can be used for economic production or consumption. They are subdivided into four categories: minerals and energy resources, soil resources, water resources and biological resources. Trade in natural resources account for approximately a quarter of global trade (Morgera and Kulovesi, 2016). For the purpose of this report, trade flow analysis will be conducted only on mineral commodities.

Growth in international commerce was made possible by the globalisation of trade and capital movements by the major trading nations in post-war periods (IMF, 2000). Consequently, international trade in minerals has grown along with world trade, as minerals constitute the bulk of industrial raw materials, since no one country is self-sufficient in all minerals. Most industrial nations need these minerals for advancement of their economies (Department of Mineral Resources, 2003). On the other hand, mineral exports provide the much-needed foreign currency to many developing countries and enable them to develop other resources and buy capital goods, which will assist them with future industrial development (Olowu *et al.*, 2016).

It is a long-held observation that developing countries tend to export raw materials and import manufactured products. The colonial construct of mining was based on supplying raw materials to European developed countries from mineral-endowed countries, thus creating an enclave of mineral economies, especially in Africa (Otto and Cordes, 2002). Africa's economies were integrated into European economies, because the former provided raw materials for the latter's industrialisation (African Union, 2009). Reinert (2007), states that as a result of the remnants of colonialism, former colonies are still suffering from the following characteristics: they are subject to diminishing rather than increasing returns; they are either lacking in learning potential and/ or the fruits of learning are passed to customers in rich countries in the form of lower prices rather than creating local wealth.

The latter days' structural construct unfortunately still persists in modern days, as tariff escalation on processed goods imposed by developed countries remains a major problem for developing countries (Thomas and Trachtman, 2009). Tariff escalation on mineral commodities suppresses diversification and sustainable development in developing countries, as there is less incentive to beneficiate raw materials into manufactured products and value-added activities. This phenomenon is further exacerbated by developed countries' drive to secure uninterrupted access to 'strategic minerals'. A recent example of this is in the US, where the President signed an Executive Order that directs the development of a strategy to reduce the reliance of the US on foreign supply for critical minerals (US Geological Survey, 2018).

Countries like China have also adopted a geopolitical strategy to secure strategic resources to meet their economic growth needs (Ministry of Land and Resources People's Republic of China, 2017). China has moved aggressively to tie up mineral concessions in Africa to secure long-term supply of raw material to support its industrialisation programme. Mikesell et al (1971), made a cautionary note to this effect, that it was disingenuous

for certain minerals to be controlled by few countries in a bid to improve their economies of scale. This trend of stockpiling of minerals termed to be strategic is of great concern since it creates an imbalance in trade flows of minerals.

#### **4.2 Impact of International Trade Rules on Trade of Mineral Resources**

Under Article II: 1(b) of the GATT, WTO members should not maintain mark-ups on import duties higher than the tariff levels bound in their specified commitments. Only under exceptional circumstances will members be allowed to exceed the binding rates (World Trade Organization, 2007). Article XX, General Exceptions, provides the legal basis on which WTO members deviate from their GATT commitments. In contrast to import tariffs, export taxes are generally not covered by binding commitments, although they are subjected to principle 4 of Article I, Most Favoured Nation Treatment. However, members are prohibited from instituting restrictions under Article XI, General Elimination of Quantitative Restrictions, whether made effective through quotas, import or export licenses or other measures (Latina *et al.*, 2011). Under Article XVIII: (2), developing countries are allowed to temporarily deviate from eliminating quantitative restrictions should the need arise if they can prove it is for developmental purposes.

Natural resources such as minerals are finite and although the WTO prohibits quantitative restrictions under Article XI, there are exceptions relating to the conservation of exhaustible natural resources, under Article XX: (a). Therefore, in order to invoke this provision, WTO members must show that the proposed restrictive measure relates to the conservation of the mineral resource and that the measures are made effective in conjunction with restrictions on domestic production or consumption (GATT, 1986). Article XX:(i) deals with exceptions “*involving restrictions on exports of domestic materials necessary to ensure essential quantities of a resource*

*to a domestic processing industry during periods when the domestic price of such materials is held below the world price as part of a governmental stabilization plan” (GATT, 1986, p.38). Provisions with this arrangement are that such restrictions shall not operate to increase the exports of or the protection afforded to such domestic industry.*

### **4.3 Tariff Escalation**

Tariff escalation has been identified by the thirty eighth session, Ministerial Declaration on 29 November 1982, as an impediment that discouraged exports of processed and manufactured goods from other contracting parties, especially of developing countries being imported into the markets of developed countries. A decision was brought forward to take effective action towards the elimination or reduction of such escalation where it inhibits international trade (GATT, 1982).

A long-standing complaint of developing countries is that tariff escalation by developed countries created an impediment to industrialisation of developing countries by forcing their production towards less processed products (World Trade Organization, Economic Research and Analysis Division, 2001). The wide disparities between nominal tariffs on raw materials and processed goods, as Vaidya (2006) pointed out, disadvantaged many developing countries when trying to export manufactured goods to developed countries.

Provisions for international commodity agreements such as GSP, were aimed at addressing the unique challenges of tariff escalation facing commodity-exporting countries. GSPs are meant to address the structural imbalances in the trading system by granting preferential tariffs to imports from developing countries (World Trade Organization, 2010b). However, criticism has been raised that most GSP programs by design would cover primary goods relative to manufactured goods from developing countries.

The observation is that GSP has benefited richer developing countries while providing virtually no assistance to the world's least developed countries (International Business Publication, 2010). Countries like the U.S have attempted to close some of these gaps through supplementary preference programs such as the African Growth and Opportunity Act (AGOA).

#### **4.4 Preferential Treatment Agreements and Regional Integration**

Preferential Treatment Agreements (PTAs) are unilateral trade preferences in the WTO, which can be negotiated between two countries, among several countries or among one or several PTAs that have already been formed (World Trade Organization, 2020b). This may be in the form of free trade agreements, or customs unions with common external tariffs.

The terms Regional Trade Agreements (RTAs) and Preferential Trade Agreements (PTAs) are often used interchangeably even though PTAs have transcended regional boundaries over time. PTAs include Generalized System of Preferences schemes as well as other non-reciprocal preferential schemes (World Trade Organization, 2011).

Economic integration is the formation of countries into groups with variation in economic sizes, which can result from a political or economic agreement (Yarbrough and Yarbrough, 2011). Figure 13 below illustrates five stages of economic integration representing the degree of unification.

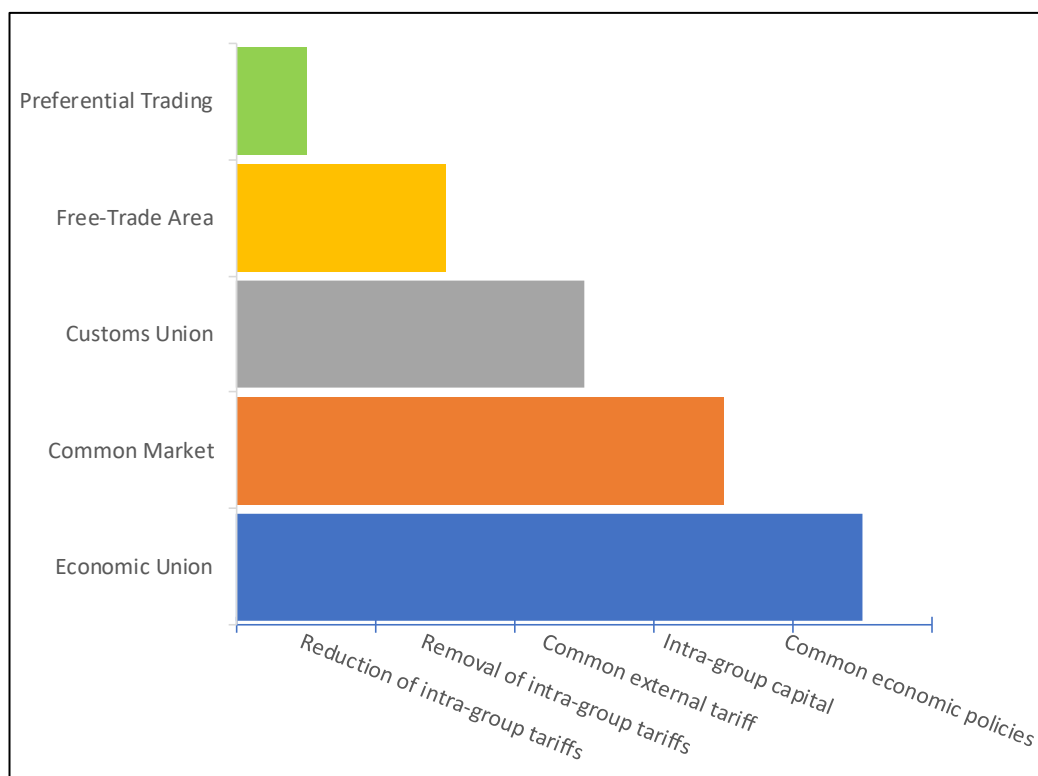


Figure 13: Levels of Economic Integration

Source: Adapted from (Yarbrough and Yarbrough, 2011)

- i. Preferential Trading – the lowest level of integration where member countries agree to maintain lower barriers to trade within the group than to trade with non-member countries. Countries continue to determine their trade policies separately, but with the inclusion of preferential treatment of group members.
- ii. Free-Trade Area – is the next level of integration which involves eliminating barriers to intra-group trade while they maintain nationally determined barriers to trade with non-member countries.
- iii. Customs Union – ameliorates the problem of transshipment and ensures that intra-group trade does not face barriers while members maintain a common external tariff (CET) on trade with non-member countries.
- iv. Common Market – extends free trade to factors of production, such as labour migration and capital flows together with goods and



services. Member countries typically maintain fixed exchange rates among their national currencies.

- v. Economic union – the most extensive form of economic integration. Member countries need to agree on a very wide range of issues and policies as well as a common currency or money.

#### **4.4.1 Regional Trade Agreements in Africa**

Africa is a resource-rich continent, but it is characterised by high levels of impoverishment and is economically poor in what is described as the paradox of plenty (Carmody, 2011). This can also be attributed to the design of the world trade system, which allowed developed countries for a prolonged period to protect their domestic markets by providing subsidies on their primary products (Boulle *et al.*, 2014).

Carmody (2011), noted that most of the continent's resources are traded in their raw form, which is problematic because primary commodities tend to be characterised by volatile prices, lack of technological dynamism and local economic linkages. Instead of regional intergration, poor countries in Africa and Latin America have entered into bilateral agreements with developed countries, subjecting themselves at the low end of the world wage hierachy as suppliers of raw materials and technological dead-ends, Reinert (2007). African countries trade more with developed countries than among themselves. Intra-African trade is quite low and lacks diversification (Figure 14).

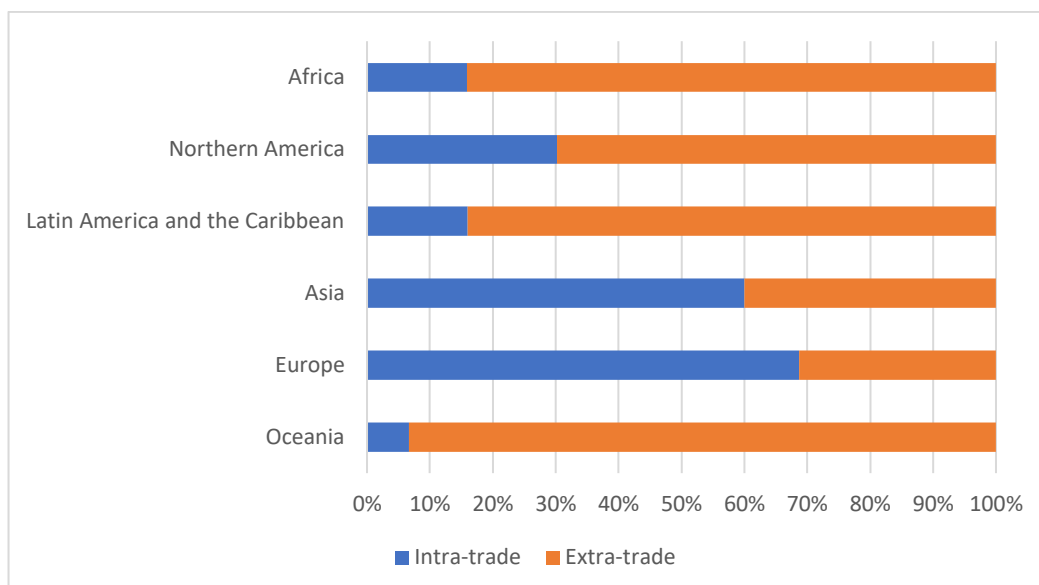


Figure 14: Intra- and Extra-Trade Group Exports, 2018

Source: (UNCTAD, 2019b)

Lee (2010), makes an assertion that although developed countries offer preferential access to markets to developing countries through preferential agreements, the relationship was asymmetric in terms of product offering. Developing countries supply mainly primary goods, and developed countries, manufactured goods. In a bid to improve the trade imbalance and meet the liberalising demands of the WTO, the European Union has devised Economic Partnership Agreements (EPAs) with African, Caribbean and Pacific countries. However, critics have raised concerns that EPAs actually do not promote trade for African countries, instead they favour European countries by facilitating the dumping of their subsidised products in the continent, which also undermine Africa’s existing regional arrangements (Southall, 2010).

African countries represent over a quarter of the WTO membership by number, however, their participation in the global trading system has been minimal and ineffective because of their approach of fragmented trade policies (Laker, 2014). While analysing the framework of mineral policies for countries in the Southern African Development Community (SADC) region,

Mtegha (2005) mentions that regional integration facilitates for member states to effectively participate in the global economy and offers credibility to security of capital as a bloc. Similar arguments can be put forward for African countries to have an integrated continental approach when participating at the WTO.

#### **4.4.2 Africa Continental Free Trade Area (AfCFTA)**

Africa is currently undergoing an intensified process of economic restructuring on the back of increasing global resource scarcity. Regional integration in Africa is intended to increase the continent's collective bargaining power with developed countries (Carmody, 2011). Friederich List and Giuseppe Mazzini were strong proponents of the continental free trade area, but they cautioned that free trade should be intermediate before globalisation (Reinert, 2007).

The Africa Continental Free Trade Area (AfCFTA) agreement entered into force on 30<sup>th</sup> May 2019, after receiving twenty-two instruments of ratification from National Parliaments of the African Union Member-States in conformity with legal provisions (African Union, 2019). As of January 2020, 30 countries out of the 55 African Union member states ratified the agreement.

The AfCFTA aims to open up new markets, promote regional integration and contribute to economic growth through exploitation of opportunities for scale production, continental market access and better reallocation of resources. The main objective is to create a single continental market for goods and services, with free movement of business persons and investments. It also seeks to advance intra-African trade through better harmonisation and coordination of trade liberalisation in the continent (Tralac Trade Law, 2020).

Africa's 55 countries boast a total population of about 1.2 billion people and the AfCFTA seeks to integrate and consolidate the fragmented markets in each country and region into a US\$ 2.5 trillion common market. The continent's GDP is forecast to grow rapidly, from an estimated \$3 trillion in 2020 to \$16 trillion by 2060, according to African Development Bank (UNECA and AUC, 2020). The AfCFTA will provide a great opportunity for African businesses to constructively share and contribute in the continent's rapid market growth.

Between 2015 and 2017, seventy percent of Africa's exports outside the continent were unprocessed extractives, such as oil and minerals (UNECA and AUC, 2020). The great risk with commodities like oil and minerals is that they are volatile to prices. AfCFTA will assist the continent to move away from dependence on extractives to a more sustainable and diversified commodity basket. Access to markets and size has been cited too often by various studies as a prohibiting factor for developing countries to manufacture beneficiated products. Bhengu (2015) mentions that foreign markets, specifically in developed countries, tend to impose high tariffs on beneficiated products making it challenging for developing countries to access those markets. With the operation of the AfCFTA coming into effect, the economies of scale will encourage producers of raw materials and manufacturers to beneficiate products in the continent.

#### **4.5 Tariffs and Trade Analysis**

Latina *et al.* (2011), note that tariffs on natural resources are generally lower than for overall merchandise trade and the structure of tariff protection tend to rise significantly in the natural resource sectors than elsewhere, where raw materials face on average lower duties than their processed forms (Figure 15). Although this might be the case, WTO members are prohibited under Article II of GATT to apply any import duties higher than what was agreed in their commitments (World Trade Organization, 2010b). Table A 1

in the Appendices outlines the tariff structure for natural resources compared to overall merchandise in developed and developing countries.

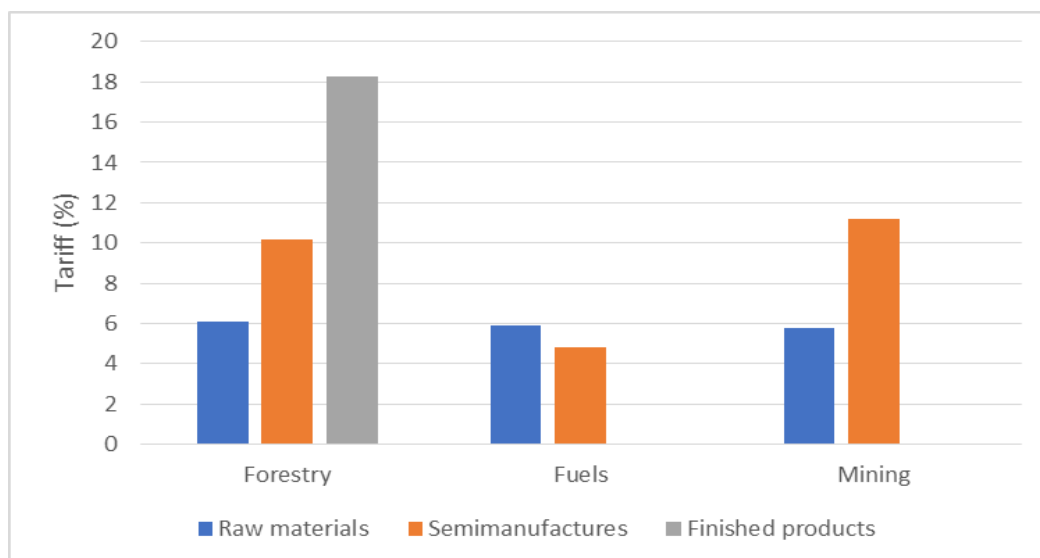


Figure 15: Structure of Tariff Protection by Stage of Processing

Source:(World Trade Organization, 2010b)

According to the WTO (2001), increase in tariff escalation is prevalent in metals and mineral products at each production stage. To measure the level of tariff protection in the metals and mineral sector, the latest available data on applied MFN tariffs was obtained from the WTO's IDB through the World Integrated Trade Solution of the World Bank. A sample of 10 countries, which included both developed and developing countries was analysed to obtain a balanced representation. The sample was based on countries which have the capacity to produce fluorspar and facilities for downstream value addition. Simple average tariff rates were used for calculations. In order to analyse tariff escalation, countries' nominal tariffs were grouped by stages of processing, from raw materials to semi-manufactured products and finished products (Table 8). The table covers the analysis on the mineral products cluster, for the expanded version including metals, fuels and chemicals please refer to Table A 4 in the Appendices.

Table 8: Simple Average MFN Tariff Rates by Stage of Processing on Selected Countries, 2018

Import markets	Stages of Processing	MFN Applied Rate	Standard Deviation	Variance	Escalation Factor
Canada	Raw materials	0.19	1.14	1.29	
	Semi manufactures	0	0	0	-1.00
	Finished products	2.42	2.44	5.93	0.00
United States	Raw materials	0.34	1.78	3.18	
	Semi manufactures	1.04	2.1	4.4	2.06
	Finished products	3.59	6.1	37.19	2.45
China	Raw materials	4.31	3.03	9.18	
	Semi manufactures	8.1	9.96	99.22	0.88
	Finished products	14.5	8.77	76.89	0.79
Brazil	Raw materials	3.68	2.27	5.16	
	Semi manufactures	4.86	4.31	18.56	0.32
	Finished products	12.33	5.06	25.65	1.54
Russia	Raw materials	6.09	3.48	12.08	
	Semi manufactures	10.13	5.32	28.25	0.66
	Finished products	11.59	4.89	23.9	0.14
European Union	Raw materials	0.17	0.62	0.39	
	Semi manufactures	2.2	1.84	3.37	11.94
	Finished products	3.39	2.69	7.24	0.54
Australia	Raw materials	0.43	0.89	0.8	
	Semi manufactures	0.79	1.58	2.49	0.84
	Finished products	3.3	2.38	5.68	3.18
India	Raw materials	10.07	4.92	24.25	
	Semi manufactures	9.28	1.72	2.97	-0.08
	Finished products	11.97	5.12	26.26	0.29
Japan	Raw materials	0.21	0.41	0.17	
	Semi manufactures	0.36	1	1	0.71
	Finished products	1.59	2.14	4.58	3.42
South Africa	Raw materials	0.21	1.75	3.07	
	Semi manufactures	0.36	4.73	22.4	0.71
	Finished products	1.59	7.7	59.25	3.42

Source: UN Comtrade data accessed via World Integrated Trade Solutions (World Bank, 2020b)

Note: \*Latest available import tariff data for China and Russia are for the years 2017 and 2016 respectively

The majority of countries showed a tariff escalation with the stages of processing, but to varying degrees, with the exception of Canada and India, which had a tariff de-escalation from raw materials to semi-manufactured products. Canada did not levy any duty on semi-manufactured mineral products. Tariff applied on India's imported semi-manufactured mineral products de-escalated by a factor of 8 percent, from a 10.07 percent duty levied on raw materials. The general tariff escalation for the sample, from raw materials to semi-manufactured mineral products, rose by an average factor of 1.7, while for semi-manufactured mineral products to finished products it increased by a factor of 1.6. Most developing countries levied an import tariff above 10 percent for finished products, except for South Africa, which levied a mere duty of 1.59 percent compared to other developing countries.

From the sample, the average tariff rate levied by developed countries on semi-manufactured mineral products is 0.9 percent and 2.9 percent on finished products. Developing countries levied an average tariff rate of 6.5 percent on semi-manufactured mineral products and 10.4 percent on finished products. Although the tariff rates levied by developed countries might seem lower than the ones levied by developing countries, the tariff escalation factor of developed countries is higher than that of developing countries. The tariff escalation factor of developed countries is almost 6 times greater than that of developing countries for semi-manufactured mineral products and 2 times higher for finished products.

Exports and imports of four standard product groups selected for this study are constructed at the HS six-digit level from the World Integrated Trade Solution of the World Bank. The standard product groups are defined according to the UNCTAD statistical classifications of products. In 2018, Australia was a leading exporter of minerals accounting for 24 percent of the world share value followed by Brazil (10.2 percent) and Chile (8.9 percent) in second and third places respectively (Table 9). The leading

importer of minerals was China accounting for 44 percent of the world's consumption followed by Japan (7.4 percent) and South Korea (4.9 percent) in a distant second and third positions. China was leading the pack in exports of metals accounting for 13.7 percent of the world share value with Germany and the US accounting for 9.7 percent and 8.6 percent respectively.

Table 9: Leading Exporters and Importers of Minerals and Metal Products, 2018

Minerals					
Exporters	Value (US\$ billion)	Share in World (%)	Importers	Value (US\$ billion)	Share in World (%)
Australia	57.9	24.1%	China	143.9	44.1%
Brazil	24.4	10.2%	Japan	24.1	7.4%
Chile	21.4	8.9%	South Korea	15.9	4.9%
Peru	18.2	7.6%	Germany	11.5	3.5%
South Africa	12.2	5.1%	India	10.6	3.2%
United States	9.6	4.0%	United States	7.7	2.3%
Canada	9.4	3.9%	Spain	7.2	2.2%
Indonesia	5.6	2.3%	Belgium	4.9	1.5%
China	4.9	2.0%	Canada	4.3	1.3%
Russia	4.8	2.0%	Netherlands	4.0	1.2%
Others	67.7	28.2%	Others	63.7	19.5%
Metals					
China	186.3	13.7%	United States	145.0	10.5%
Germany	117.6	8.6%	Germany	110.6	8.0%
United States	66.7	4.9%	China	104.5	7.5%
Japan	58.9	4.3%	Italy	49.9	3.6%
Italy	52.1	3.8%	France	45.9	3.3%
South Korea	51.3	3.8%	Korea	40.6	2.9%
Russia	43.6	3.2%	India	39.8	2.9%
France	39.6	2.9%	Japan	37.3	2.7%
Belgium	38.2	2.8%	United Kingdom	35.5	2.6%
Netherlands	34.4	2.5%	Belgium	34.0	2.5%
Others	575.4	42.3%	Others	627.3	45.3%

Source: UN Comtrade data accessed via World Integrated Trade Solutions (World Bank, 2020b)



Russia was the leading exporter of fuel products in 2018, accounting for 12.5 percent of global share value followed by US (10 percent) and United Arab Emirates (6.2 percent) (Table 10). The leading importer of fuel products in the same period was China, accounting for 11.9 percent of world share value followed by US at 8.3 percent and India at 7 percent. Germany was the leading exporter of chemicals in 2018, accounting for 9.9 percent of the global share value, followed by US (7.8 percent) and China (6.7 percent). The leading importer of chemicals in the same period was US accounting for (11.9 percent) of consumption share value, followed by Germany (7.9 percent) and China (7.8 percent).

Table 10: Leading Exporters and Importers of Fuels and Chemical Products, 2018

Fuels					
Exporters	Value (US\$ billion)	Share in World (%)	Importers	Value (US\$ billion)	Share in World (%)
Russia	237.9	12.5%	China	347.8	11.9%
United States	191.4	10.0%	United States	241.7	8.3%
United Arab Emirates	118.8	6.2%	India	205.1	7.0%
Canada	99.7	5.2%	Japan	174.6	6.0%
Norway	76.4	4.0%	Korea	147.0	5.0%
Kuwait	65.4	3.4%	Germany	117.7	4.0%
Netherlands	63.2	3.3%	Singapore	87.9	3.0%
Australia	58.3	3.1%	Netherlands	79.4	2.7%
Singapore	54.0	2.8%	France	73.9	2.5%
India	48.6	2.5%	Italy	67.7	2.3%
Others	804.7	42.2%	Others	961.9	32.9%
Chemicals					
Germany	203.7	9.9%	United States	234.9	11.9%
United States	159.1	7.8%	Germany	155.1	7.9%
China	136.7	6.7%	China	154.7	7.8%
Belgium	114.8	5.6%	Belgium	99.3	5.0%
Switzerland	104.8	5.1%	France	71.7	3.6%
Ireland	102.0	5.0%	Japan	66.8	3.4%
France	92.0	4.5%	United Kingdom	64.8	3.3%
Netherlands	73.8	3.6%	Italy	62.4	3.2%
United Kingdom	62.9	3.1%	India	58.7	3.0%
Japan	61.1	3.0%	Netherlands	51.2	2.6%
Others	624.6	30.5%	Others	794.0	40.2%

Source: UN Comtrade data accessed via World Integrated Trade Solutions (World Bank, 2020b)

#### 4.6 Chapter Summary

Tariff escalation has been a long-standing complaint of developing countries, which has been identified as one of the major impediments to industrialisation of developing countries. The chapter examined the prevalence of import restrictions placed on mineral resource products. It looked at the leading exporters and importers of mineral products and

examined the pattern of effectively applied tariff rates in the minerals industry by looking at the extent of tariff escalation on semi-manufactured and finished natural resource products.

The chapter also looked at the international trade rules under which import tariffs may be applied on natural resources and assessed the impact of PTAs on mineral trade flows with a particular emphasis on the Africa Continental Free Trade Area agreement. Quite often the argument of access to markets and size has been mentioned as a prohibiting factor for developing countries to manufacture beneficiated products. With the operation of the AfCFTA coming into effect, the economies of scale will encourage producers of raw materials and manufacturers to beneficiate products in the African continent and improve intra-continental trade.

The chapter concludes by presenting the results obtained from conducting a tariffs and trade analysis on selected developed and developing countries. An assessment was conducted to determine the degree of tariff escalation as an impediment for industrialisation in developing countries. The next chapter will make a value proposition case for the South African fluorochemical industry by looking at how tariff reductions could encourage beneficiation of fluorochemical products (especially fluorocarbons) in the country.

## **CHAPTER 5: CASE STUDY – SOUTH AFRICA’S FLUORSPAR BENEFICIATION VALUE PROPOSITION**

### **5.1 Introduction**

Mining is a significant component of South Africa’s economy and it dates as far back as 1870 (Leeuw, 2012). South Africa is among a few countries in the world endowed with a vast range of mineral deposits, most of the country’s minerals rank in the top ten countries with mineral reserves. For the longest time traditional minerals such as gold, diamonds, Platinum Group Metals (PGMs), coal and iron ore have been the bedrock of the economy, but demand for non-traditional minerals such as battery minerals, fluorspar and rare earth minerals amongst others are beginning to gain prominence.

Despite the comparative advantage in mineral resource endowment, the levels of beneficiation have been low in most of these minerals and concentrated in the high capital sectors of the mineral value chain (Department of Mineral Resources, 2011). President Cyril Ramaphosa, in the State of the Nation Address in 2019, mentioned that government will bolster the mining industry by developing markets for South African minerals through targeted beneficiation indicating how critical mineral beneficiation is to the country’s industrialisation plan.

This chapter will present a value proposition case for South Africa’s fluorspar industry to promote industrial growth. The chapter will also look at the lost opportunity cost on the fluorspar value chain and how tariff escalation on processed goods impact on the trade of value-added products.

## 5.2 South Africa's Economy

South Africa is ranked as an upper-middle income economy by the World Bank, accounting for 21 percent of Africa's GDP (2018) in terms of purchaser's prices (World Bank, 2019). The country is also the gateway to other African markets and has the highest trade volumes out of 48 Sub-Saharan African states, as well as low tariff barriers to trade. An average tariff rate of South Africa on all products is estimated at 6.5 percent (Trade Map, 2018). The country is ranked 77<sup>th</sup> out of 141 countries by the 2019 Global Competitiveness Index on Trade Openness of the World Economic Forum (Table 11).

Table 11: South Africa's Global Competitiveness Index, Trade Openness, 2018

INDICATOR	VALUE	Rank (77/141)
1. Prevalence of non-tariff barriers	4.3	88
2. Trade tariffs	7.07	90
3. Complexity of tariffs	4.9	94
4. Border clearance efficiency	3.2	34
5. Distortive effect of taxes and subsidies on competition	3.6	80
6. Extent of market dominance	3.8	74
7. Competition in services	5.2	50

Source:(World Economic Forum, 2019)

Foreign Direct Investment to develop natural resources in South Africa from western-countries and now recently China, has without a doubt resulted in increased production, exports and processing capacity. However, the bulk of demand from the country's trading partners in western and Asian markets is still for unprocessed goods with low value addition, heightening the risk

of locking resource-rich countries like South Africa into a primary exports trajectory. South Africa's main export and import partner is China (Table 12). South Africa's heavy reliance on China as a market for its exports means it is highly vulnerable to market dynamics in that country. An example is the slowdown in trade with China because of the COVID-19 health risk. Table 12 below lists South Africa's top five trading partners in both exports and imports.

Table 12: South Africa's Merchandise Trade Statistics, 2019

<b>Exports</b>	<b>Imports</b>
R1 298 billion	R1 273 billion
Trade Balance: R24 699 million	
Top 5 countries export destination	Top 5 countries import arrivals
China (10.7%)	China (18.5%)
Germany (8.3%)	Germany (10%)
United States (7%)	United States (6.6%)
United Kingdom (5.2%)	India (4.9%)
Japan (4.8%)	Saudi Arabia (4.2%)

Source: (SARS, 2020) & (Trade Map, 2018)

South Africa's main export categories are heavily dominated by the minerals, metals and fuel products, which accounts for 52.8 percent (R688 billion in 2019) of total exports (Figure 16). The country mostly imports machinery and complex manufactured products, which the volumes amounted to R403 billion accounting for about 32 percent of total imports.

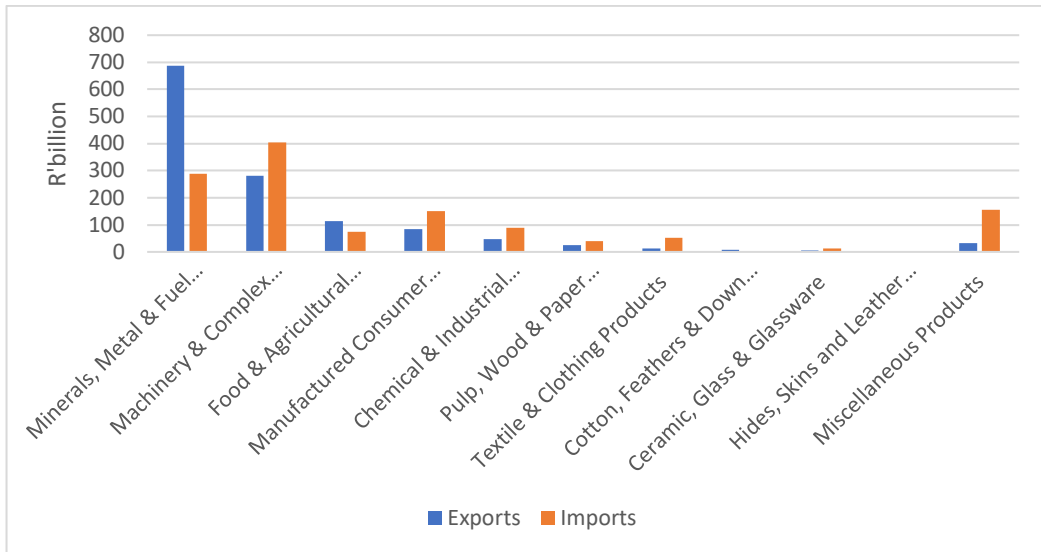


Figure 16: South Africa's Top 5 Exports and Imports by Categories

Source: (Trade Map, 2018)

### 5.3 Role of Mining in the National Economy

Research conducted by Citibank indicated that South Africa's non-energy in situ resources are estimated at US\$2.5 trillion (Figure 17), making the country one of world's richest in terms of mineral wealth (Baxter, 2011).

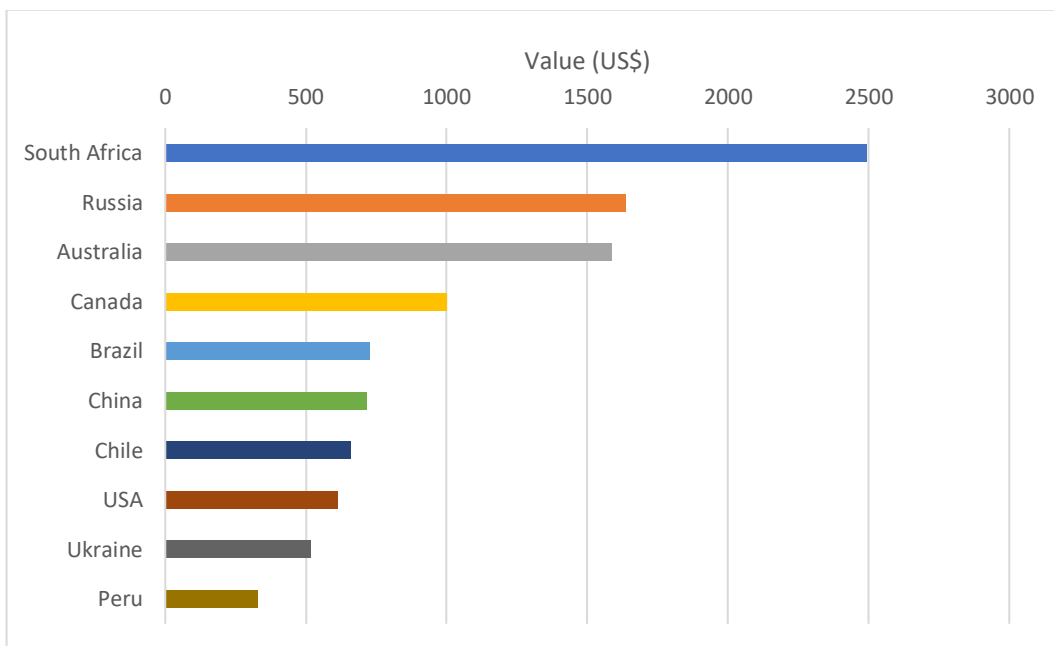


Figure 17: Non-energy in-situ mineral resources valuation by country

Source: Citibank in (Baxter, 2011)

The country hosts substantial resources of industrially important metals and minerals (Figure 18). This includes 91 percent of recognised global reserves of platinum group metals (PGMs), 32 percent of manganese, 35 percent of chrome, 16 percent of vanadium, 13 percent of fluorspar and 6 percent of gold amongst others (US Geological Survey, 2020).

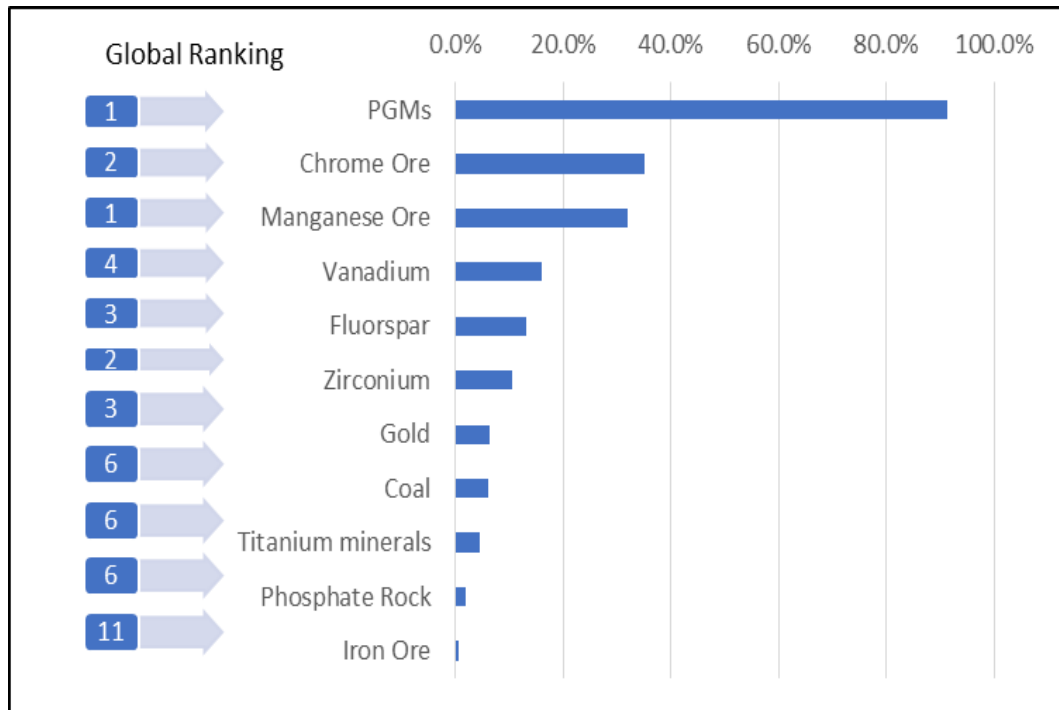


Figure 18: South Africa's Reserves of Key Minerals and Ranking, 2019

Source: (US Geological Survey, 2020)

The mining industry is considered to be important in the economy because it is a major earner of foreign exchange and absorbs quite a significant number of unskilled labour in a country with an unemployment rate of 29.1 percent (Q4-2019) (Statistics South Africa, 2020). In 2019, direct contribution made by mining to the GDP was 8.3 percent and the industry employed about 460 014 people (Department of Mineral Resources, 2020). The Minerals Council of South Africa (previously Chamber of Mines) estimated that mining contributed indirectly an additional 10 percent to GDP owing to the multiplier and induced effects of mining on the rest of the economy, making up about 18 percent in total (Baxter, 2013). The multiplier



factor is a composite of social, primary incomes, employment, and income terms of trade and capital formation. The Minerals Council further estimated that another R300 billion in downstream turnover and 150 000 jobs are created in beneficiation industries that use minerals mined in South Africa.

As much as mining is the backbone of the South African economy, the country seems to have not derived optimum value from the industry. South Africa missed out on the last commodity boom with mining GDP declining by 1 percent per annum between 2001 and 2008, compared with an average 5 percent growth experienced in the top 10 mining economies during the same period (Figure 19).

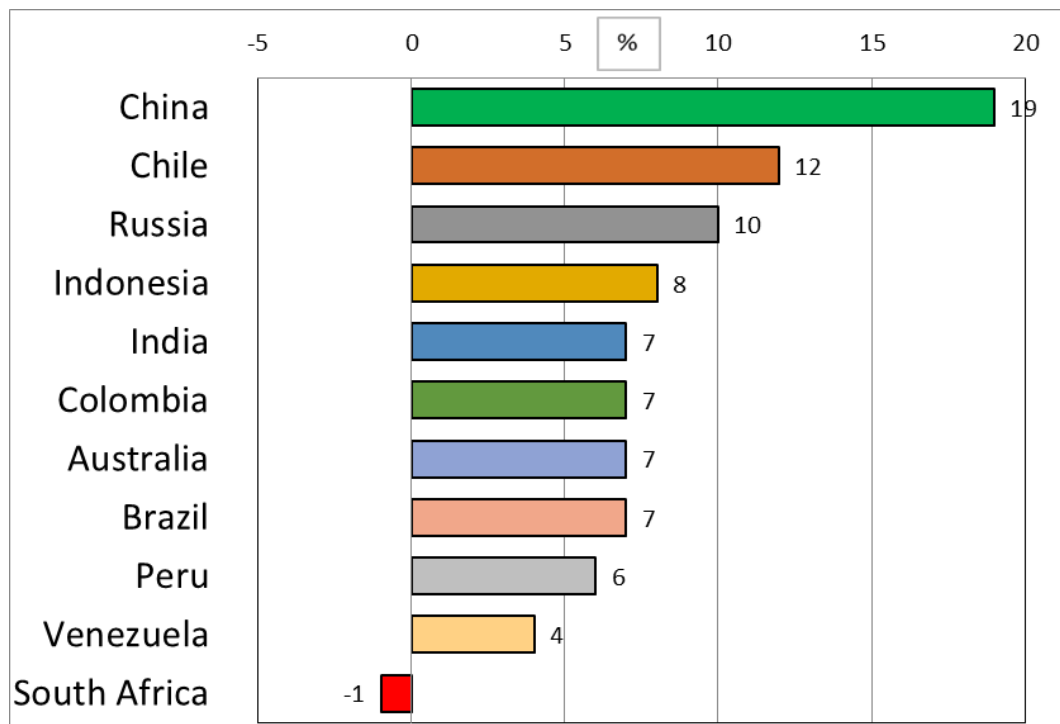


Figure 19: The global top ten mining countries as measured by growth in mining value added to GDP, 2001-2008 (US\$ real terms)

Source: *Global Insight in (Baxter, 2011)*

South Africa's export basket is heavily dependent on the country's mineral resources. Post 1994, as one of its trade strategies, the country's trade policy was guided by the development of mineral related exports, which it

accomplished by shaking off high tariffs, subsidies and import substitution. Mining contributed R376.4 billion (8 percent) to GDP measured in nominal prices in 2019, this is an increase of 7.3 percent compared with the previous year.

The economy depends heavily on foreign trade and more than half of the gross national product (GNP) is derived from imports and exports (Department of Mineral Resources, 2020). In 2019, South Africa's trade balance with the rest of the world was R24.68 billion, with exports amounting to R1 298 billion and imports slightly lower than exports at R1 273 billion (Figure 20).

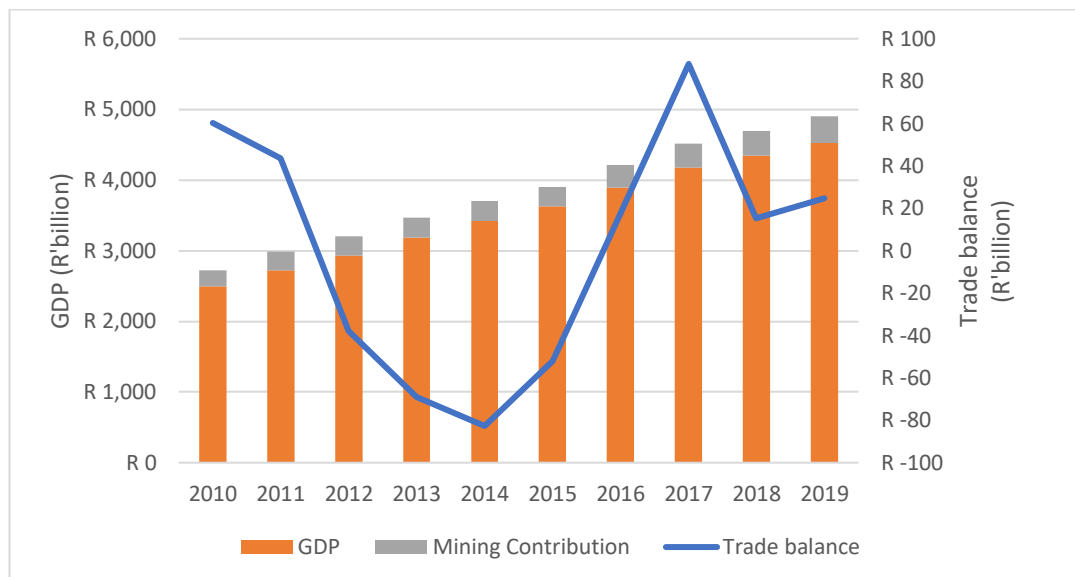


Figure 20: GDP and Trade Balance of South Africa

Sources: (Department of Mineral Resources, 2020)

(SARB, 2020)

(Department of Trade and Industry, 2020a)

South Africa exports most of the minerals it produces and imports them as processed minerals due to lack of investment in downstream value addition activities, which is exacerbated by the prevalent tariff escalation that is renowned with mineral trade. It is much cheaper to export minerals in their raw form than in their processed state. The insufficient investment in

downstream value addition activities has resulted in the country missing the opportunity to industrialise rapidly and advance development. The opening up of the economy since 1994 and becoming a member of the WTO, has increased export and trade volumes of commodities. However, it has also presented the country with a new set of challenges, which implied that it could not restrict trade of certain mineral commodities it deemed strategic to advance economic development.

#### **5.4 A Case for Beneficiation for South Africa**

South Africa's balance of payments has been skewed for many years in favour of its trading countries because of its history of being a raw mineral exporter and importer of manufactured products (Department of Mineral Resources, 2011). Unless a concerted effort is taken to stimulate local beneficiation, developed countries will continue to obtain raw materials in their crudest form from developing countries such as South Africa, at the lowest costs (Bhengu, 2015). In order to diversify and grow its economy, resource-rich countries such as South Africa need to transition from exporting raw materials to more manufactured products. Dependence on mining by the Southern African region leaves it highly vulnerable to swings in global markets. While there is a strong drive for downstream beneficiation, Baxter (2013), points that, there is less attention on the significant impact that mining has on side-stream sectors.

South Africa's objectives are to promote investment-led growth and pursue the development integration model that combines market integration, industrial and infrastructure development. Furthermore, it is to enhance competitiveness and realise economies of scale that would catalyse minerals cluster development (Department of Trade and Industry, 2018) .

The concept of beneficiation is not new in South Africa. In 1928, the government passed a law that led to the founding of state-owned company,

Iscor (Pty) Ltd. to reduce the country’s reliance on imports (Tunyiswa, 2014). South Africa’s Beneficiation Strategy was adopted by Cabinet in 2011 as policy and seeks to increase the level of mineral beneficiation and create opportunities for new enterprise development and a knowledge-based economy. The Department of Mineral Resources (2011, p.1), states that the *“beneficiation strategy is supported by a number provisions within existing national policy and legislation, such as the Minerals and Mining Policy for South Africa (1998), Minerals and Petroleum Resources Development Act, the Broad-Based Socio Economic Empowerment Charter, the Precious Metals Act, the Diamonds Amendment Act, energy security plan as well as compliance with environmental protocols”*.

South Africa has successfully achieved stages 1, 2 and 3 (upstream) beneficiation levels (Tunyiswa, 2014). Stage 1 focuses on converting minerals into concentrates from mining, recovery, reduction and smelting activities (Table 13). Stage 2 focuses on converting mineral concentrates into intermediate products, it is the transition between the mining sector and the industrial sector. Stage 3 is the refining of intermediate products into high-value products. The country has been less successful in achieving stage 4 (downstream) beneficiation. Stage 4 focuses on producing fabricated articles.

Table 13: Stages in the Beneficiation of Metals and Industrial Minerals

Stages of Beneficiation	Metals	Industrial Minerals
Stage 1	Saleable smelted products	Processed raw materials
Stage 2	Fabrication alloys and metals	Basic final products
Stage 3	Semi-manufactured articles	Refined final products
Stage 4	Fabricated articles	Fabricated articles

Source: (Robinson and Von Below, 1990)

Some of the constraints to downstream mineral beneficiation (Stage 4) in South Africa is the historical legacy of the country's Minerals-Energy Complex. The country's economic structure leans towards upstream mineral exploitation, with the bulk of producers locked in long-term contracts with their international clients, resulting in the country being deficient in developing capital and intermediate goods (Fine and Rustomjee, 1996).

The National Development Plan (NDP) has set out a goal of full employment by 2030, and the State has identified beneficiation as a catalyst towards addressing unemployment (Statistics South Africa, 2017). However, capacity building programmes, are often missing. It is noted that the prospect for value-added processing requires a different set of skilled labour compared to the current set of skills in most developing countries (Davis and Vasquez Cordano, 2013). The necessary skills base can be developed through professional and vocational training to absorb the shocks associated with the changing skills requirements. Developing countries like South Africa need to strengthen higher education and training programmes in the mining industry to bridge the skills gap requirements to improve labour market efficiencies.

## **5.5 Fluorspar value chain**

The South African Beneficiation Strategy initially identified five value chains: energy, steel and stainless steel, pigment production, auto-catalyst and diesel particulate, and diamond processing jewellery (Department of Mineral Resources, 2011). This list was not exhaustive and other value chains such as the polymers and chemical value chain, which will include fluorspar, will later be considered for future economic modelling (Table 14). South Africa recognises in IPAP 2010/11 – 2012/13 that products of the primary chemical sector form the basis for almost every manufacturing activity and the beneficiation of fluorochemicals will assist the country to

diversify the economy beyond reliance on traditional commodities (Department of Trade and Industry, 2010).

Table 14: South Africa's Selected Value Chains and Minerals for Beneficiation

Selected Value chains	Selected Commodities										
	Gold	PGMs	Diamond	Iron Ore	Chromium	Manganese	Vanadium	Nickel	Titanium	Coal & Uranium	Fluorspar
Energy										√	√
Steel and Stainless Steel				√	√	√	√	√			√
Pigment Production									√		√
Auto-catalysts and Diesel Particulates		√									
Diamond Processing and Jewellery	√	√	√								
Polymers and Chemicals											√

Source: Adapted from (Department of Mineral Resources, 2011)

Fluorspar is the commercial name for calcium fluoride (CaF<sub>2</sub>). It is graded into acid fluorspar grade (acidspar) and metallurgical grade fluorspar (metspar). Acidspar has a minimum of 97 percent CaF<sub>2</sub> and is mainly consumed in matured markets in the production of hydrogen fluoride (HF)

and represents about 53 percent of annual global consumption of fluorspar (Department of Mineral Resources, 2016a). Metspar has anything between 70 – 80% CaF<sub>2</sub> and is used to blend burned lime in the steel industry and as a fluxing agent for aluminium metallurgy, and has a global consumption of about 47 percent.

Fluorocarbons, which are mainly used in refrigerants and air conditioning, accounts for about 63 percent of HF global consumption, followed by metal treatment at 8 percent, petroleum and alkylation catalyst at 5 percent and uranium fuel production at 3 percent (Figure 21). In the Appendices, Figure A 1 expands on different generations of fluorocarbon products.

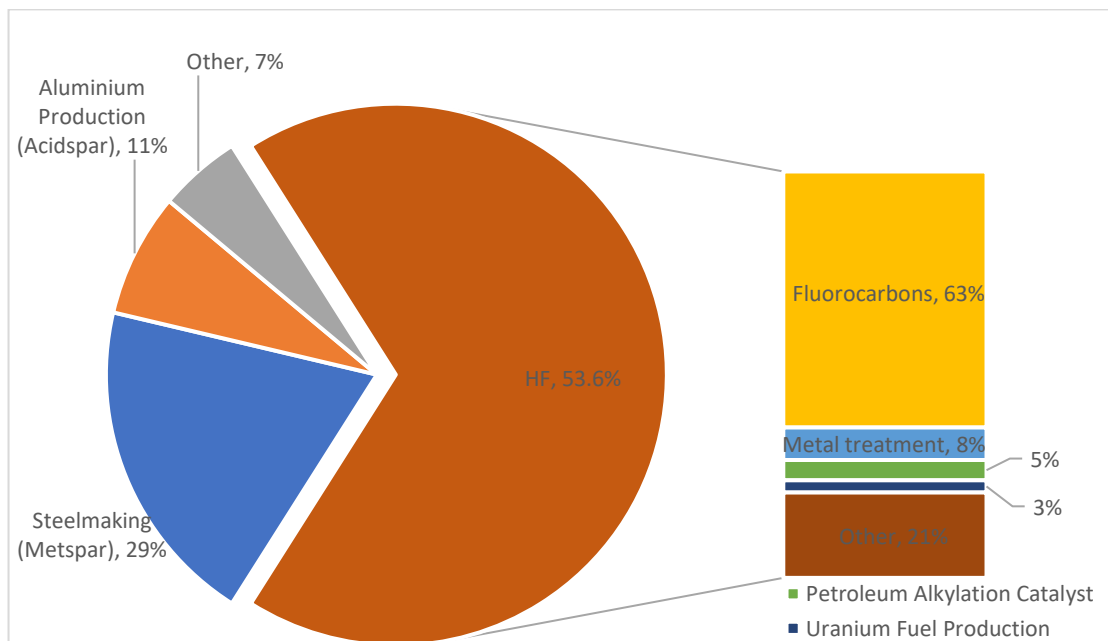


Figure 21: Global Fluorspar Consumption and Derivatives

Source: Adapted from (Department of Mineral Resources, 2016a) & (IHS and IDC, 2013)

Fluorspar deposits exist in commercially exploitable quantities in a few countries. South Africa has the third largest reserves of fluorspar in the world at 41 Mt after China at 42 Mt and Mexico at 68 Mt (US Geological Survey, 2020). The world consumption of fluorspar is estimated at about 6.9 Mt and production at 7 Mt. Despite having the third largest fluorspar reserves in the world, South Africa exports the bulk of its fluorspar in an

unbeneficiated state to international markets. IHS and IDC (2013), mentions that comparative studies on beneficiation such as the one done on Saudi Arabia's stranded natural gas and hydrocarbon resources show that it is possible to industrialise by leveraging on a country's natural resources. However, for beneficiation to take effect certain inhibitive factors will have to be addressed, such as the international parity pricing mechanism used by some producers, which ultimately renders downstream beneficiation uncompetitive. IHS also mentions that *'the international price determination for raw and intermediate materials, which do not discount proximity to production further compound the requisite access to input minerals for local value addition'*.

Most of the early-stage beneficiation programs require large and uninterrupted supply of energy, which South Africa's electricity utility (Eskom) is currently struggling to meet demand because of the aging plants. However, a reprieve was offered to the industry in the form of allowing operations to self-generate electricity through independent power producers (IPP) contracts. The current trade barriers, by some of South Africa's prospective recipients of beneficiated products also tend to limit access to their markets.

There are a number of common linkages between the mining cluster and the fluorochemicals cluster such as science and technology network, education and skills development programmes, and sophisticated financial systems. The development of a fluorochemicals cluster in South Africa can provide bridge between upstream mining and manufacturing industry by assisting in developing the requisite skills in producing high-end products in sectors such as the automotive industry (Figure 22). Based on derived revenues, the potential value to multiply fluorspar conversion could range between five-fold and ten-fold levels without considering other multiplier effects in downstream innovation and development (IHS and IDC, 2013).



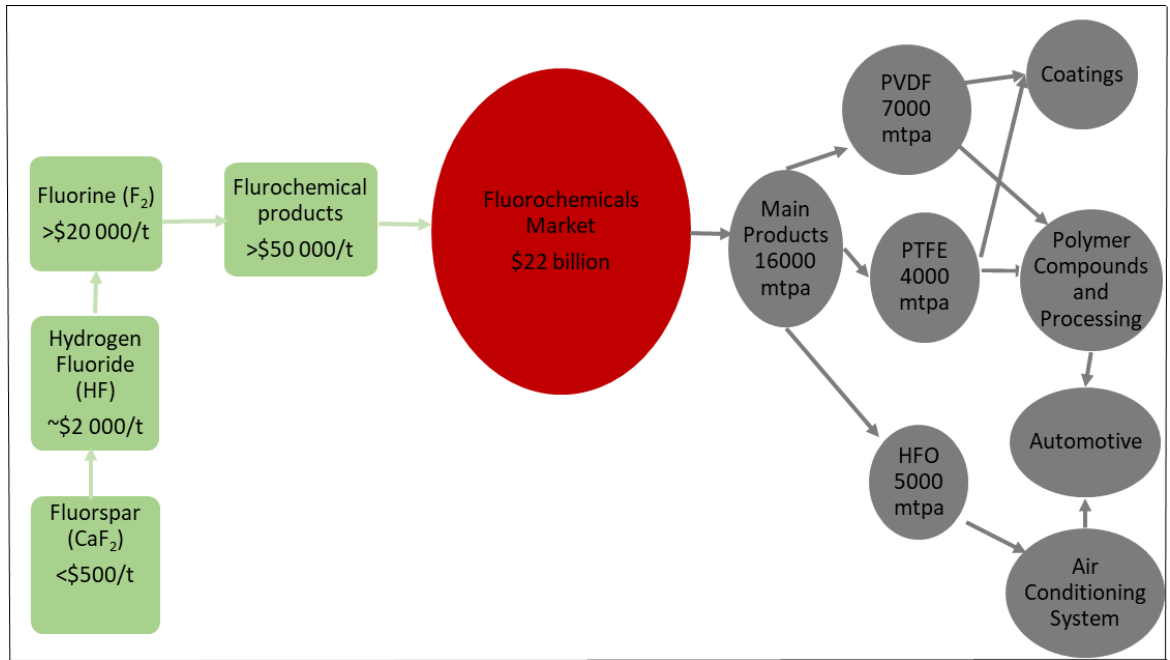


Figure 22: Fluorochemicals Value Chain

Source: Adapted from (IHS and IDC, 2013)

Much of the focus on beneficiation in the past has been misdirected at the lack of the mining sector's participation to drive the manufacturing/fabrication of beneficiated products. It is uncommon for a miner to participate at every step of the value chain leading up to manufacturing (Baxter, 2013). However, mining should play a crucial role in ensuring supply of raw materials to local producers is guaranteed and affordable. The Minerals Council of South Africa has cautioned that as much as beneficiation is necessary for the development of the country's economy, the basis to pursue it should not be entirely pinned on the country's comparative advantage. A holistic offering to potential partners in the form of favourable financing should also be considered, as it was the case in the development of stranded hydrocarbons and gases in countries like Saudi Arabia by offering investors investment packages that included favourable commercial loans. The initiatives will include reliable plant operations and supply chain management to ensure feedstock security of supply through appropriate infrastructure and competitively priced products. Furthermore, will be the establishment of duty-free special economic zones with low tax

rates for manufacturing. Although pursuing beneficiation seems like a logical step for South Africa, there are some constraints that would need to be addressed first in order to optimise the full extent of the potential (Table 15).

Table 15: Beneficiation – Obstacles and Interventions from a Fluorochemical Perspective

<b>Cross-Cutting Constraint</b>	<b>Potential Interventions</b>	<b>Implications</b>
<b>Limited access to raw materials for local beneficiation</b>	Leverage the beneficiation offset of the Mining Charter. Address import-parity pricing especially of steel and heavy chemicals. Expand local demand for mined materials.	Concern that the WTO regulations might be breached with the limited raw material supply intended for exports markets, but the impact should be minimal considering South Africa's global market share.
<b>Shortages of critical infrastructure</b>	Use the State's infrastructure as an effective instrument to promote local beneficiation. Ensure that existing infrastructure planning properly consider requirements for mineral beneficiation. Electricity co-generation to address shortage of energy supply.	Feedstock security of supply vital for potential partners and investors
<b>Limited exposure to R&amp;D</b>	Align R&D requirements to the national science and technology plan. Support and develop competitive technologies	Build on university partnerships as chairs for fluorochemical research
<b>Inadequate skills</b>	Align the beneficiation skills pipeline to the National Skills Development Strategy. Business to invest in Human Capital Development.	Partner with Universities to build capacity in the fields of fluoro-based chemistries, polymer processing and fabrication capabilities
<b>International market access</b>	Leverage on trade agreements. Ensure that future trade agreements adequately support beneficiation intent. Take advantage of the partnership with China to support investment in beneficiation in South Africa as well as access to markets in China as a major player for consuming and supplying fluorochemicals.	Form partnerships with established fluorochemical companies.

Source: Adapted from (Department of Mineral Resources, 2011)

In a bid to promote mineral beneficiation, section 26 of the Mineral and Petroleum Resources Development Act, 2002 (MPRDA) states that “*The Minister may initiate or prescribe incentives to promote the beneficiation of minerals in the Republic*”(Department of Mineral Resources, 2002, p.34). However, if these incentives are not considered holistically with the impact that international trade regimes have on trade of beneficiated minerals, the incentive packages presented by government may still remain unattractive to potential investors. The following section will look at the impact that tariff escalation has on mineral beneficiated products through the fluorspar value chain.

### **5.5.1 Analysis and Presentation of Data**

As mentioned in the literature review, a tariff is a tax or duty levied on a traded good as it crosses a national border, which can both be levied on imported and exported goods. Countries opt to impose tariffs on goods for different economic reasons such as reducing consumption of a particular good, generate revenue for government and the most common use is to insulate the domestic market from competition.

Import tariffs are strategically used for rent-shifting by resource-importing countries to extract rents from resource-exporting countries. The effect of an import tariff on natural resource on a static model is illustrated in Figure 23, where all available resource is exhausted in a given period. From the model suppose that there are two countries, an exporter and an importer of a resource, fluorspar for the purpose of this report, and (Q) is the total amount of a resource and (S) is its supply curve. If all of the fluorspar extracted is exported then the free trade price for a given demand curve (D) is ( $P_1$ ). If the importing country imposes a tariff T then the demand curve (D) shifts to (D') and the new equilibrium will be at the export price ( $P_1^T$ ). To support the argument that import tariffs are used by governments to extract rents from exporting countries, from the model importers will continue to pay

the price ( $P_1$ ), the price at which they demand quantity ( $Q$ ), while the exporter will receive the price ( $P_1^T$ ). Tariff revenue collected by government of the importing country is represented by the shaded area in the figure. Tariff ( $T$ ), which is the difference between ( $P_1$ ) and ( $P_1^T$ ) reflects the reduction in rent suffered by the exporting country.

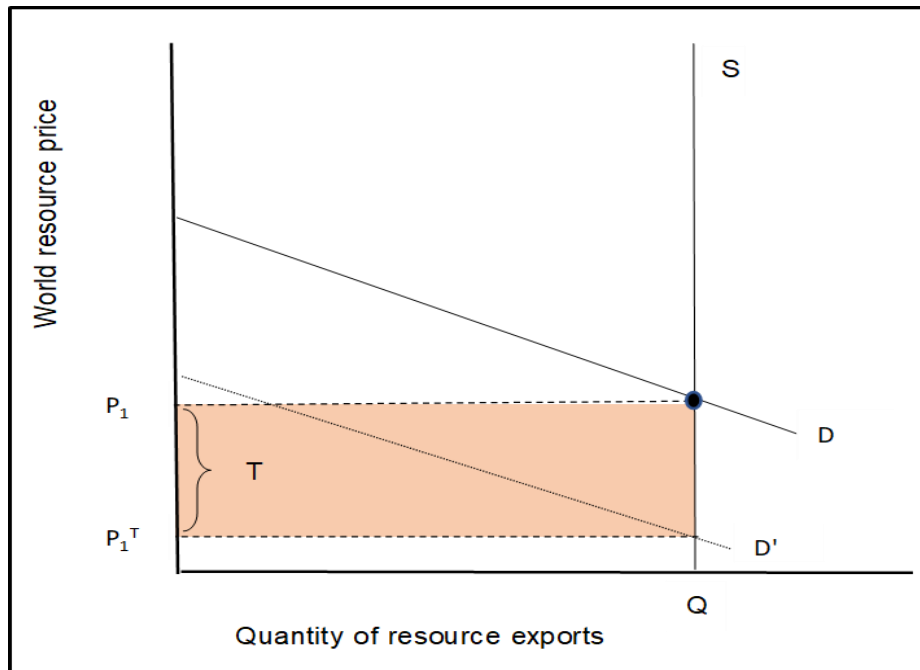


Figure 23: The Effect of an Import Tariff on Natural Resource, (Static Model)

Source: (World Trade Organization, 2010b)

In the event that there is substantial local demand in the resource-rich country, from a local processing industry, then the exporting country can respond to the import tariffs imposed by its trading partners by restricting exports. This will limit the importing country's ability to extract the entire rent since supply will no longer be fixed (Brander and Djajic in (World Trade Organization, 2010b)).

The World Integrated Trade Solution Database of the World Bank was used for simulation and presentation of tariff data together with the WTO Integrated Database. The Trade Map dataset of the International Trade

Centre was used as the main source for import trade data at HS six-digit tariff-line level.

- **Structure of the Fluorspar Industry in South Africa**

South Africa currently has two active producers of fluorspar, viz., Vergenoeg Mining Company (VMC) and Sepfluor's Nokeng fluorspar mines, both located in Rust de Winter, north of Gauteng. Vergenoeg is owned by the Spanish group Minersa, it is the biggest producer of fluorspar in South Africa and is reported to be the second largest producer in the world. Sepfluor is a subsidiary of a South African group, Sephaku Holdings. Sepfluor commenced operating in August 2019.

Witkop and Buffalo mines, which used to be the other active producers of fluorspar, owned by Sallies, stopped producing fluorspar around 2008, because it was not economically efficient due the volatility of the market at that time. Witkop mine focused on its limestone production instead, while Buffalo was mothballed. The market for fluorspar has since stabilised and the Witkop mine is currently looking to go back into fluorspar production. Witkop mine is located east of Ottoshoop in North-West province and Buffalo mine near Mookgophong in Limpopo province. The other fluorspar project is that of SA Fluorite, owned by Eurasian Resources group, in Doornhoek in North-West province. The Doornhoek fluorspar project is expected to bring about 120-150 kt per annum to the market whereby feasibility completion will be in 2020 and commercial operation by 2022.

The South African Nuclear Energy Corporation (Necsa), through its subsidiary Pelchem, is the processing facility of hydrogen fluoride (HF) in South Africa and other fluorochemicals. Hydrogen fluoride is used in many applications including nuclear fuel enrichment, development of fluorocarbons used in refrigerants, metal processing industries, petroleum industry and the development of polymers

- **Production and Exports of Fluorspar**

In the five-year period, South Africa’s fluorspar production increased at a growth rate of 17.5 percent per annum from 2015 – 2019 (Figure 24). Production increased between 2015 and 2017 as a result of improved demand for acid-grade fluorspar from the fluorocarbons market. Acid-grade fluorspar accounts for over 85 percent of South Africa’s fluorspar production and metallurgical-grade fluorspar makes up the balance. Production slightly flattened between 2017 and 2018 following maintenance and plant optimisation at Vergenoeg mine, the only active producer of fluorspar at that time. Production declines were also influenced by heavy rainfalls in the last quarter of 2018 before rising again in 2019, partly owing to the coming online of Sepfluor’s production in August of the same year.

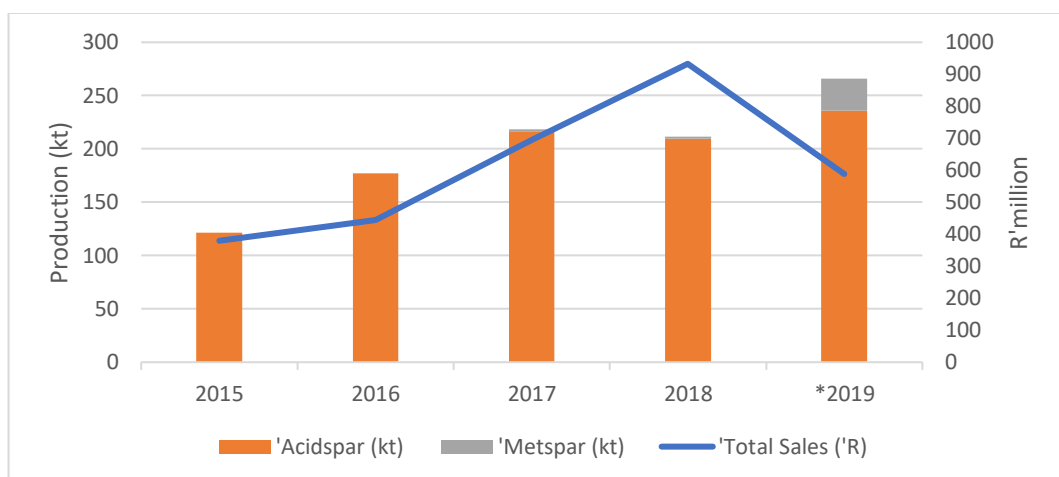


Figure 24: South Africa's Fluorspar Production and Exports, 2015 – 2019

Sources: Production (Department of Mineral Resources, 2019) and Exports (SARS, 2020) Note: \*2019 figures are estimates

South Africa’s exports sales value during the same period from 2015 – 2019 were on a rise following fluorspar deficit in the markets owing to China constraining supply as a result of government-ordered shutdowns of polluting production. Tight fluorspar supply from 2018 to 2019 kept prices at historic highs and with the introduction of two new producers to the market,

Sepflur and Canada Fluorspar, prices are expected to soften in the short-term.

- **Importing Markets of South Africa’s Fluorspar and Derivatives**

In 2018, the value of fluorspar imported from South Africa by trading partner countries amounted to R 924 million with a moderate estimate of R 591 million in 2019 (Table 16). In the Appendices, Table A 2 and Table A 3 show the disaggregated imports of fluorspar into acidspar and metspar. In 2019, the acidspar accounted for the bulk of fluorspar demand from South Africa’s importing countries. South Africa’s acidspar was mainly consumed by Netherlands (52%), Italy (23.9%) and United Arab Emirates (12.2%), while the metspar was consumed by the United States (94%), India (5.9%) and China (<0.1%).

Table 16: Leading Importing Countries of South Africa's Fluorspar by Value, 2015 - 2019

Importers	Exported value in 2015 (R'000)	Exported value in 2016 (R'000)	Exported value in 2017 (R'000)	Exported value in 2018 (R'000)	Exported value in 2019 (Estimates) (R'000)	Average tariff (estimated) applied by the country (%)
<b>World</b>	<b>358 977</b>	<b>443 625</b>	<b>692 853</b>	<b>924 059</b>	<b>591 457</b>	
Netherlands	107 584	143 200	121 198	191 226	291 103	0.0
Italy	82 825	43 776	126 640	69 333	132 987	0.0
USA	87 746	95 584	78 041	195 874	96 500	0.0
UAE	0	38 193	56 049	268 670	67 980	5.0
India	15 867	56 761	184 591	122 920	2 367	10.0
Spain	23 097	37 152	479	39 104	0	0.0
China	0	0	40 151	36 602	115	3.0
Lesotho	0	0	0	0	289	0.0
Zimbabwe	0	0	13	13	29	5.0
Tunisia	41 730	28 959	77 828	0	0	0.0

Source: (Trade Map, 2018) and (World Trade Organization Integrated Database, 2020)

Hydrogen fluoride (HF) is regarded as an intermediate product in the value chain of fluorspar. It is used in the production of a variety of other products. It is a highly reactive acid, and only a few facilities are authorised to manufacture and handle it. In South Africa such facility is Pelchem, a state-owned entity, which is a manufacturer and supplier of commodity and speciality chemicals. In 2019, South Africa's hydrogen fluoride was mainly consumed by Singapore (36.8%), Brazil (19%) and Australia (18.5%) (Table 17).

Table 17: Leading Importing Countries of South Africa's Hydrogen Fluoride by Value, 2015 - 2019

Importers	Exported value in 2015 (R'000)	Exported value in 2016 (R'000)	Exported value in 2017 (R'000)	Exported value in 2018 (R'000)	Exported value in 2019 (Estimates) (R'000)	Average tariff (estimated) applied by the country (%)
<b>World</b>	21 930	29 238	24 692	22 791	8 501	
Singapore	76	513	1 623	2 054	3 132	0.0
Brazil	8 181	13 967	15 060	9 993	1 617	10.0
Australia	5 796	8 046	4 683	6 320	1 573	0.0
New Zealand	0	0	0	0	664	0.0
Namibia	89	117	186	211	375	0.0
Botswana	63	337	253	355	346	0.0
Zambia	25	29	93	145	289	0.0
Zimbabwe	254	249	226	224	188	
Democratic Republic of Congo	101	44	93	158	87	5.0
Angola	140	103	133	276	87	0.0

Source: (Trade Map, 2018) and (World Trade Organization Integrated Database, 2020)

Fluorine is a compressed gas used in the manufacturing of pharmaceutical products among other things. As a consequence of the complexity and danger associated with fluorine chemistry there is a few countries that have the technology and capability to deal with fluorine gas processing. South



Africa is among those few countries that have the infrastructure to handle fluorine and its derivatives. This ability places the country in a strong position, with a potential to turn this into a competitive advantage (Department of Mineral Resources, 2016b). In 2019, South Africa's fluorine was mainly consumed by Zambia (45.5%), Lesotho (17.1%) and Botswana (14.7%) (Table 18).

Table 18: Leading Importing Countries of South Africa's Fluorine by Value, 2015 - 2019

Importers	Exported value in 2015 (R'000)	Exported value in 2016 (R'000)	Exported value in 2017 (R'000)	Exported value in 2018 (R'000)	Exported value in 2019 (Estimates (R'000))	Average tariff (Estimated) applied by the country (%)
<b>World</b>	<b>3 222</b>	<b>1 744</b>	<b>1 849</b>	<b>2 515</b>	<b>3 045</b>	
Zambia	216	293	346	500	1 386	0.0
Lesotho	0	0	0	171	520	0.0
Botswana	482	15	359	553	447	0.0
United States of America	774	689	213	474	245	4.6
Democratic Republic of Congo	266	88	173	553	159	5.0
Malawi	0	0	0	0	130	5.0
Mozambique	685	381	532	53	87	2.5
Namibia	0	15	53	13	29	0.0
Eswatini	76	29	53	26	29	0.0
Angola	89	0	13	0	0	0.0

Source: (Trade Map, 2018) and (World Trade Organization Integrated Database, 2020)

- **Fluorochemical products markets**

The market for fluorochemical products is estimated at \$22.4 billion (Table 19), based on trade of imported products from trading partner countries in 2018, this figure is a modest estimate since it does not take into account the domestic trade of each nation. China accounted for 11 percent of global fluorochemical product imports followed by United States at 8.7 percent and Germany at 6.5 percent. The fluorocarbons market is estimated at \$ 1.8 billion using the same methodology with Italy (9.5%), Germany (8%) and France (5.9%) ranking amongst the top three importing countries in 2018.

Table 19: Leading Importing Countries of World's Fluorochemical Products by Value, 2015 - 2019

Importers	Imported value in 2015 (US\$'000)	Imported value in 2016 (US\$'000)	Imported value in 2017 (US\$'000)	Imported value in 2018 (US\$'000)	Imported value in 2019 (Estimates) (US\$'000)
<b>World</b>	<b>16 440 899</b>	<b>16 930 846</b>	<b>20 188 384</b>	<b>22 345 944</b>	
China	1 738 687	1 867 680	2 286 297	2 453 222	2 456 739
United States of America	1 652 728	1 565 306	1 737 135	1 939 219	1 848 930
Germany	970 790	1 047 534	1 245 901	1 447 141	1 251 969
Korea	952 675	1 012 817	1 152 613	1 239 152	1 257 245
Netherlands	703 350	850 888	1 125 273	1 076 543	1 056 739
Belgium	628 780	705 994	1 203 820	978 425	863 932
Mexico	736 870	770 977	799 054	954 022	
India	532 409	554 623	617 739	952 843	
Japan	656 554	648 708	780 523	909 407	949 518
Italy	494 028	507 256	659 213	837 223	626 260

Source: (Trade Map, 2018) and (World Trade Organization Integrated Database, 2020)

Table 20 shows the average tariff applied by selected countries on fluorochemical products. The sampled countries were selected to give representation of both developed and developing countries. From the sample, there is generally a high degree of tariff protection on processed and value-added products. Import of primary raw materials attracted no custom duties except in the case of Korea, India and Brazil. The countries that displayed the lowest custom duties from the sample were China, Mexico and South Africa. The origin of South Africa's imports of fluorochemical products is expanded in Table A 5 in the Appendices.

Table 20: Average Import Tariffs on Fluorochemical Products Applied by Selected Countries

	Fluorspar 'Metspar' (2529.21) & 'Acidspar' (2529.22)	Hydrogen Fluoride "HF" (2811.11)	Fluorine (2801.30)	Fluorinate dacyclic hydro- carbons (2903.39)	Mixtures containing chlorofluoro carbons "CFCs" (3824.71)	Mixtures containing hydro- chloro fluoro carbons "HCFCs" (3824.74)	Mixtures containing Perfluoro carbons "PFCs" (3824.78)	Polytetra fluoro ethylene "PTFE" (3904.61)
European Union	0.0	5.5	5.3	4.4	6.5	6.5	6.5	6.5
United States	0.0	0.0	4.6	1.2	3.7	3.7	3.7	2.9
Mexico	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0
Korea	2.2	5.5	5.5	5.5	6.5	6.5	6.5	6.5
Thailand	0.0	0.0	0.0	0.0	1.5	3.0	3.0	3.0
Japan	0.0	0.0	0.0	1.4	1.3	1.3	1.3	4.2
China	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
India	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
South Africa	0.0	0.0	0.0	0.0	2.7	2.0	0.0	0.0
Brazil	4.0	10	2.0	1.8	8.0	6.0	8.0	2.0

Source: (World Trade Organization Integrated Database, 2020)

- **Modelling and simulation**

From Table 20, average import tariffs levied on fluorochemical products by selected countries, it is evident that South Africa is among the countries that impose the lowest tariffs on input materials required for manufactured products in the fluorochemicals industry. The average tariff rate charged by South Africa on all fluorochemical products is 0.59 percent. The duty levied by the country on fluorspar as the primary raw material and hydrogen fluoride as the intermediate product for the next stage processing is zero. This might imply that the country is not using tariffs to protect its primary producers, which in any case would not have any significant impact on the influx of supply in the domestic market, because the country has the third largest world reserves. However, the problem of constrained supply to local consumers has been reported in the downstream value chain, because there are fewer producers, and they tend to use import parity pricing. Import parity price is a pricing mechanism used by suppliers of a good, which requires domestic market customers to pay the same price as others in the international market (Parr, 2005). The pricing structure would include the world price plus transport costs, tariffs and other importing costs the customer would bear

The domestic fluorspar market is relatively small compared to the country's reserves, so it is natural that producers will look at export markets to sell their product in a raw state. However, the practice of using the international parity pricing mechanism is squeezing the margins of local processing plants and would ultimately render downstream beneficiation uncompetitive. On the other hand, from the sample, developed countries and regions with large markets for fluorocarbon products are protecting their manufacturing industries by imposing tariffs on processed and manufactured products. The issue of tariffs increasing with processing stages, although it seems negligible, under 10 percent, from the dataset, it is among the factors that

discourage investment in the downstream value chain. Other factors include infrastructure, workforce skills levels and security of energy supply.

In a bid to encourage downstream beneficiation in South Africa the study will look at three propositions. The first construct will use the SMART modelling tool from the World Bank to assess the impact that a policy instrument such as increasing or decreasing tariffs on fluorochemical products will have on the flow of trade. Secondly, the argument of using export taxes to ensure security supply of feedstock to local plants will be explored. Thirdly, consideration of using the WTO instruments, such as schedules of concession, PTAs and GSP, to gain access to the fluorocarbon markets.

- **Construct 1: Impact of a tariff increase on flow of trade**

The first construct is illustrated in two scenarios. Scenario 1 assesses the impact of variation of tariff rate in the range of 1 percent – 5 percent on fluorochemical products (Table 21). The varied tariff rates are informed by the average effective applied rates of each tariff line relative to the sampled countries in Table 20. From Table 21, it is observed that there is a negative total trade effect with the varied increase of rate on the majority of the tariff lines. The industry will experience a high margin of trade diversion as opposed to trade creation. Furthermore, some of the charged tariff rates will be outside of the country's bound tariff rate, and this would result in some form of query from the WTO. However, the country can argue that the trade diversion and bridging the bound limit is for developmental purposes to stimulate downstream value addition of products in the industry, but this will have to be approved by the WTO.

Table 21: The Effect of a Static Tariff Increase on Fluorochemical Products

Tariff line	Bound Duty Rate	Applied Duty Rate	Trade Value (US\$'000)	New Duty Rate					
				1 percent		3 percent		5 percent	
				Trade Total Effect (US\$'000)	Import Demand	Trade Total Effect (US\$'000)	Import Demand Elasticity	Trade Total Effect (US\$'000)	Import Demand Elasticity
252921	0	0	1927	-26.96	1.399	-80.90	1.399	-134.84	1.399
252922	0	0	78	-1.68	2.148	-5.04	2.148	-8.39	2.148
280130	10	0	75	-1.21	1.605	-3.62	1.605	-6.04	1.605
281111	10	0	463	-3.48	0.752	-10.45	0.752	-17.42	0.752
290339	15	0	39591	-301.63	0.761	-904.89	0.761	-1508.15	0.761
382471	14	1.79	46	0.1879	0.984	-0.7208	0.984	-1.63	0.984
382474	13.3	1.39	152	1.1117	0.984	-1.8438	0.984	-4.78	0.984
382478	12.5	0	15363	-151.21	0.984	-453.63	0.984	-756.05	0.984
390461	15	0	6895	-69.38	1.006	-208.13	1.006	-346.88	1.006

Source: Author's simulation generated through the Single Market Partial Equilibrium Simulation Tool (World Bank)

Notes Tariff lines: Metspar (252921); Acidspar (252922); Fluorine (280130); HF (281111); Fluorinated hydrocarbons (290339); Mixtures containing CFCs (382471); Mixtures containing PFCs (382478); PTFE (390461)

In Scenario 2 tariff incremental rates were varied in terms of bound (maximum) rates being applied on primary products, and relaxed (minimum) rates being applied on processed products (Table 22). Fluorspar (acidspar and metspar) and HF were classified as primary products, and fluorine, fluorinated hydrocarbons, mixtures of CFCs, mixtures of PFCs and PTFE were classified as processed products.

From Table 20 it was established that South Africa applies a zero effective rate on imports of fluorspar with the bound rate also capped at zero. In the simulation (Table 22), the applied tariff rate was allowed to exceed the

bound rate to 5 percent, even though this might result in a trade diversion, this is in a bid to protect producers in the domestic industry so that they have an incentive not to apply import parity pricing in the local market. Domestic processors have already complained about paying international prices to acquire fluorspar from domestic producers (Pelchem, 2018).

Table 22: The Effect of a Hybrid Tariff Increase on Fluorochemical Products

Commodity	Bound Duty Rate	Applied Duty Rate	New Duty Rate	Trade Value (US\$'000)	Trade Total Effect (US\$'000)	Import Demand Elasticity
Metspar (252921)	0	0	5	1927.489	-134.839	1.399118
Acidspar (252922)	0	0	5	78.133	-8.39409	2.148666
Fluorine (280130)	10	0	1	75.20818	-1.20713	1.605051
HF (281111)	10	0	5	463.2344	-17.4213	0.75216
Fluorinated hydrocarbons (290339)	15	0	0	39591.89	0	39591.89
Mixtures of CFCs (382471)	14	1.7919	1.791	46.81935	0	46.81935
Mixtures of HFCs (382474)	13.33	1.3937	1.393	152.7784	0	152.7784
PFCs (382478)	12.5	0	0	15363.69	0	15363.69
PTFE (390461)	15	0	0	6895.293	0	6895.293

Source: Author's simulation generated through the Single Market Partial Equilibrium Simulation Tool (World Bank)

Now for processed products, it was established that South Africa already applies the minimum tariff rates on products. The tariff rates were not changed in this instance, as this was in alignment with the arguments put forward in literature that a country should impose minimum tariff rates on inputs of processed materials, while it is building capacity in that field. Therefore, there was no change in trade total effect for all processed products except for fluorine. Since South Africa has existing capacity to produce fluorine, the tariff rate for fluorine was changed from zero to 1

percent, in order to partially shield the domestic fluorine producers, but still allow sufficient quantities to satisfy downstream value addition demand. From the simulation it is observed that the increase in the tariff rate might result in a negative trade effect, but this is insignificant compared to the long-term benefits. The bound tariff rate for fluorine is 10 percent, therefore, the implementation of the new rate would not require the WTO approval.

- **Construct 2: Ensuring feedstock supply to domestic processors by applying export taxes and restrictions through legislation**

The second construct is to introduce export taxes on primary materials in a bid to secure supply for local processors and address the issue of international parity pricing. Alternatively, there could be a legislated intervention where the government sets a minimum allocation of fluorspar to the local industry at developmental pricing. Section 26 (2) of the MPRDA states that after consulting the Board and the Minister of Trade and Industry, if the Minister of Mineral Resources *“finds that a particular mineral can be beneficiated economically in the Republic, the Minister may promote such beneficiation subject to such terms and conditions as the Minister may determine”* (Department of Mineral Resources, 2002).

To ensure that the use of section 26 (2) of the MPRDA is within the parameters of the WTO framework, the government could invoke Article XX: (i) and XVIII: (2) of GATT. Article XX:(i) deals with exceptions involving restrictions on exports of domestic materials necessary to ensure essential quantities of a resource *“to a domestic processing industry during periods when the domestic price of such materials is held below the world price as part of a governmental stabilization plan”*(GATT, 1986, p.38). Provisions with this arrangement are that such restrictions shall not operate to increase the exports of or the protection afforded to such domestic industry. Under Article XVIII: (2), developing countries are allowed to temporarily deviate



from eliminating quantitative restrictions should the need arise if they can prove it is for developmental purposes.

- **Construct 3: Trade agreements**

The third construct is to use existing WTO instruments to gain access to fluorocarbon export markets by motivating for South African fluorocarbon products to be zero rated and included in the PTAs and GSP with the country's trading partners.

South Africa has been a member of the WTO since 1995 and a member of GATT since 1948 (OECD, 2019). Many changes have been made to the country's trade and industrial policies over the years, which has seen the country actively pursuing trade liberalisation reforms (Department of Mineral Resources, 2003). South Africa entered into many Bilateral Investment Treaties (BITs) after the abolishment of apartheid with many foreign countries without carefully considering their long-term impacts. However, in 2013 the country cancelled many of its BITs, mainly with EU members in order to ensure they are restructured to align with policy implementation to address the country's social and economic requirements (Mossallam, 2015).

South Africa applies Most Favoured Nation (MFN) rates to imports and preferential rates to trade partners with which it has negotiated trade agreements (Department of Trade and Industry, 2020b). The country is a beneficiary of the GSP program from several countries (Table 23). Figure A 2 in the Appendices show a map of GSP for South Africa as a beneficiary.

Table 23: Generalized System of Preference for South Africa

<b>Provider</b>	<b>Name</b>	<b>Sub-schemes</b>	<b>Initial Entry Into Force</b>
<b>Japan</b>	Generalized System of Preferences – Japan	1	8/1/1971
<b>Kazakhstan</b>	Generalized System of Preferences – Kazakhstan	1	1/1/2010
<b>Norway</b>	Generalized System of Preferences – Norway	1	10/1/1971
<b>Russian Federation</b>	Generalized System of Preferences - Russian Federation (01.01.2010 to 10.10.2016)	1	1/1/2010 - 10/10/2016
<b>Russian Federation</b>	Generalized System of Preferences - Russian Federation (As of 10.10.2016)	1	10/10/2016
<b>Turkey</b>	Generalized System of Preferences – Turkey	2	1/1/2002
<b>United States of America</b>	Generalized System of Preferences - United States	1	1/1/1976
<b>United States of America</b>	Other - African Growth and Opportunity Act	1	5/18/2000

Source: (World Trade Organization, 2020b)

More than 25 other countries maintain their own GSP programs with varying types preferences granted to beneficiary countries. GSPs are non-reciprocal to the countries issuing them and are generally for countries deemed to be in development phase.

South Africa has key trade agreements with the European Union through the Economic Partnership Agreement and the USA under the African Growth & Opportunity Act (AGOA) amongst others (Table 24).

Table 24: Summary of Regional Trade Agreements between South Africa and the Rest of the World

Country/ Bloc	Status	Positive Effect on Business
<b>Tripartite Free Trade Agreement (link Common Market for Eastern and Southern Africa – COMESA, the Southern African Development Community – SADC, and the East African Community – EAC)</b>	Signed by 16 out of 26 countries (including South Africa) – but yet to be ratified	Moderate – while most of South Africa’s main trading partners are already within the SADC area, reducing tariffs between South Africa and other African countries will undoubtedly increase trade flows between South Africa and the rest of the continent
<b>EU/ South Africa – Trade, Development, and Co-operational Agreement</b>	Active	High – establishes a Free Trade Area which covers 90 percent of bilateral trade between South Africa and the EU. South Africa is the EU’s largest trading partner in Africa and provides a large market for its commodity based products
<b>Southern African Customs Union (SACU) – South Africa, Botswana, Lesotho, Namibia and Swaziland</b>	Active	High – Duty free movement of goods with a common external tariff on goods entering any of the countries from outside the SACU. Has greatly enhanced trade flows between these countries
<b>Southern African Development Community (SADC) FTA (Between 12 SADC Member States)</b>	Active	High – An FTA, with 85 percent duty-free trade achieved in 2008. The 15 percent of trade, constituting the ‘sensitive list’, is expected to be liberalised from 2009 to 2012 when SADC attains the status of a fully-fledged FTA with almost all tariff lines trade duty free
<b>EFTA-SACU Free Trade Agreement (FTA)</b>	Active	Moderate – Tariff reductions on selected goods
<b>Africa Growth and Opportunity Act (AGOA)</b>	Active	High – The US is South Africa’s second largest exporting partner. Granted by the US to 39 Sub-Saharan African (SSA) countries (South Africa included). Preferential access to the US market through lower tariffs or no tariffs on some products. Duty free access to the US market under the combined AGOA/GSP programme stands at approximately 7 000 product tariff lines
<b>Brazil, Russia, India, China and South Africa (BRICS) grouping of countries</b>	Active	High – the grouping of countries account for one third of the world economy and expected to produce 50% of global output by 2030. This will provide South Africa with a platform to leverage its potential in the global market.

Source: (Department of Trade and Industry, 2020b) & (BMI, 2016)

The US is one of South Africa's major trading partner with over \$ 4.5 billion of value of exports to that country, which are covered under the GSP and AGOA preferential treatment programs (Figure 25).

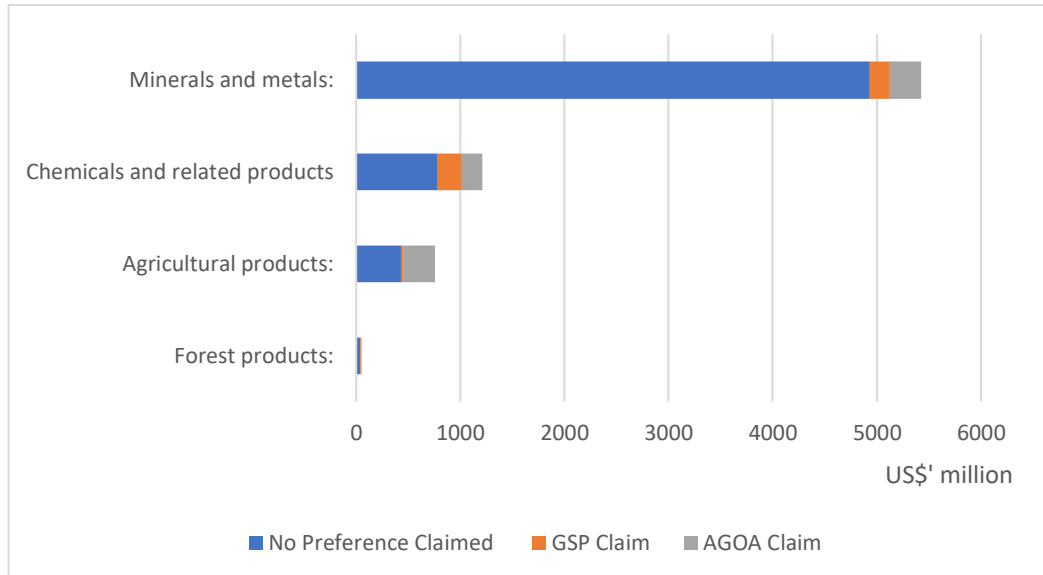


Figure 25: South Africa's Selected Primary Exports to the United States, 2018

Source: (African Growth and Opportunity Act, 2020)

Other prominent Preferential Trade Agreements include the Southern Common Market (Mercosur) and the People's Republic of China, where the country aims to promote value-added South African exports to China and increase inward investment in projects for beneficiation. Current trade negotiations for the country include the Preferential Trade Agreement with India aiming to reduce tariffs on selected goods and the African Continental Free Trade Area (AfCFTA) with the key objective to enhance economic integration in the African Continent (Department of Trade and Industry, 2020b).

## 5.6 Chapter Summary

This chapter described the importance of mining to South Africa's economy and presented the results of the fluorspar case study for beneficiation and notable findings. Research conducted by Citibank indicated that South Africa's non-energy in situ resources are estimated at US\$2.5 trillion making the country one of world's richest in terms of mineral wealth. The mining industry is considered to be important in the economy because it is a major earner of foreign exchange and absorbs quite a significant number of unskilled labour. The insufficient investment in downstream value addition activities has resulted in the country missing the opportunity to industrialise rapidly and advance development. However, the development of a fluorochemicals cluster in South Africa can provide a bridge between upstream mining and manufacturing industry by assisting in developing the requisite skills in producing high-end products in sectors such as the automotive industry.

The chapter simulated the use of different degrees of import tariffs to ascertain the level that would encourage local beneficiation of fluorochemical products in South Africa. The results from the fluorspar case study demonstrated that an import tariff rate increase in fluorspar products might result in a trade diversion. In construct 1, a static incremental tariff rates scenario of 1% - 5% and hybrid tariff rates scenario were used to investigate the effect of a tariff increase on trade to stimulate downstream value addition activities for fluorspar products and derivatives. The second construct looked at export taxes and how they can be used to resolve the problem of import parity prices that is inhibiting downstream beneficiation. The third construct looked at instruments within the WTO that could be used to improve trade of processed goods from developing countries.

## **CHAPTER 6: DISCUSSION OF RESEARCH FINDINGS**

### **6.1 Introduction**

This chapter discusses the impact of tariffs on mineral trade flows. Furthermore, in a case study, it compares the results of different tariff rates being imposed on fluorspar products in a bid to support and stimulate the domestic downstream value addition activities in developing countries, with the focus on South Africa. The chapter is divided into three sections. Section A discusses the impact of tariffs on trade of mineral commodities from developing countries. Section B discusses the proposition for downstream beneficiation in developing countries and the rationale by looking at South Africa's fluorspar industry. Section C looks at some of the factors impeding beneficiation in developing countries and solutions to remove the barriers. The section further expands on the importance of the requisite skills needed for the fluorochemical industry.

### **6.2 Section A: Impact of Tariffs on Trade of Mineral Resources**

Most developing countries' resources are traded in their raw form, which is problematic because primary commodities tend to be characterised by volatile prices. Former colonies and most of developing countries are still experiencing diminishing returns in trading their mineral commodities because of close links to western economies as suppliers of raw materials.

From the analysis on trade and tariffs in section 4.5, tariff escalation was observed in both developed and developing countries. The majority of countries from the sample showed a tariff escalation with the stages of processing, but to varying degrees, with the exception of Canada and India, which had a tariff de-escalation from raw materials to semi-manufactured products. This suggests that the two countries are not that much protective to entry towards their processing sectors. The tariff escalation factor of

developed countries was established to be 5.8 times greater than that of developing countries for semi-manufactured mineral products and 1.6 times higher for finished products, indicating the rise in level of protection with stages of processing.

Developing countries account for 80 percent of world share value of minerals, but yet there is minimal beneficiation on the products they produce. Most value addition is performed outside their jurisdictions and sent back as finished goods. In literature it was indicated that more value is derived down the value chain since more sustainable jobs are created and commodity prices are more stable downstream.

Tariff escalation on mineral commodities suppresses diversification and sustainable development in developing countries, as there is less incentive to beneficiate raw materials into manufactured products and value added activities. It is cheaper for developing countries to continue exporting their minerals in an unprocessed state, as it provides the much-needed foreign currency revenue for governments in the short-to-medium-term to address immediate social needs at the expense of developing capital infrastructure projects to diversify the economy.

A wide disparity between nominal tariff rates of raw and processed materials creates an impediment to industrialisation of developing countries by forcing their production towards less processed products. As much as developing countries have tried to address the issue of tariff escalation with the introduction of GSP, these were ineffective since in most cases they did not cover tariff lines that would enable developing countries to branch into manufactured goods. Another detected problem from the analysis is that developing countries, especially African countries, do not trade sufficiently among themselves, intra-African trade is quite low compared to other continents and lacks diversification. Hence the coming into effect of AfCFTA is expected to improve intra-continental trade and assist the continent to

move away from dependence on extractives to a more sustainable and diversified commodity basket.

### **6.3 Section B: South Africa's Downstream Value Proposition for the Fluorspar Industry**

South Africa accounts for about 21 percent of Africa's GDP and mainly exports raw materials, and imports manufactured products from its trade partners. In order to grow its economy, the country needs to consider diversifying its export basket. As Fine and Rustomjee (1996) indicate, South Africa's economic structure leans towards upstream mineral exploitation with the bulk of producers locked in long-term contracts with their international clients, resulting in the country being deficient in developing capital and intermediate goods.

South Africa has several key trade agreements, which seem not to be optimally utilised. Although in 2013 the country cancelled many of its BITs to realign them with the country's social and industrial policies, the bulk of demand from the country's trading partners in Western and Asian markets is still for unprocessed goods with low value addition.

The mining industry is considered to be an important pillar to the South African economy because of its multiplier effect and it is a major earner of foreign exchange and absorbs quite a significant number of unskilled labour. As much as mining is the backbone of the South African economy, the country seems to have not derived optimum value from the industry through downstream value addition activities.

As much as the opening up of the South African economy in 1994 has increased export and trade volumes of commodities, insufficient investment in downstream value addition activities has resulted in the country missing the opportunity to industrialise rapidly and advance development. The



country's economic structure leans towards upstream mineral exploitation with the bulk of producers locked in long term contracts with their international clients resulting in the country being deficient in developing capital and intermediate goods. In order to diversify and grow its economy, South Africa needs to use its locational advantage of producing crude resources to establish resource-processing industries.

In the NDP, the State has set out a goal of full employment by 2030. However, this figure will have to be revised after the global effects of COVID-19 pandemic on trade and economic growth. It is estimated that the South African overall GDP at factor cost will be down by 34 percent in the full shock, with mining and production of basic chemicals expected to experience large declines of between 30% - 60% (Arndt *et al.*, 2020). The prospect for value-added processing requires a different set of skilled labour compared to the current set of skills in most developing countries. The State has always highlighted the importance of beneficiation, but now after the effect of COVID-19, this will hopefully show how important it is for the State to diversify its economy from primary industries dependence towards value addition skills in knowledge based industries.

From the analysis it is evident that South Africa is among the countries that impose the lowest tariffs on input materials required for manufactured products in the fluorochemicals industry. This implies that the country is not using tariffs to protect their primary producers, which might have led them to using import parity pricing to be competitive. The problem with import parity pricing is that it constrains supply to local processors and squeezes their margins, which then slows government's objectives to drive downstream value addition and industrialisation programmes. To benefit both the primary producers and the domestic consumers, bound tariffs should be imposed on fluorspar to enable primary producers to supply the domestic market at developmental prices by shielding them from foreign

competition. A proposed tariff structure for South Africa and its impacts on imports and revenue is outlined in Table A 6 in the Appendices.

With increase in tariffs, the industry will experience trade diversion in the short-term, but in the long-run this protective measure of the domestic industry will stimulate downstream value addition activities. To minimise the anticipated impact of trade diversion from increasing tariff rates, it is suggested that a hybrid model be adopted, where bound tariff rates are applied on the primary and semi-manufactured products, then more relaxed rates on input processed products that South Africa is not yet in a position to manufacture. A more relaxed tariff regime on input materials for the fluorocarbon industry, will ensure availability of critical products like chloroform for downstream fluorochemicals activities, while capacity and infrastructure is being developed. However, the lowering of tariffs will also allow competitors to enter the market initially intended for local producers. Imposing bound rates, within the WTO framework, will provide an incentive to the domestic primary producers to shield them from aggressive competition from external producers of raw materials once the downstream demand picks up.

The government can protect the initial phase of the configuration of the industry by ensuring that revenue collected from custom duties as a result of tariff increases is ring-fenced in developing capacity in downstream value addition activities in the fluorocarbon industry. The government can also use export taxes and provisions in legislation to protect the initial stages of the establishment of the domestic fluorocarbon industry. Natural resources are often used as input materials in the value chain in most higher-value added industries. Therefore, applying an export tax will act as an indirect subsidy to the manufacturing sector by reducing the price of resource inputs. In this way export taxes will be used to avoid de-industrialisation and also promote the infant industry in the country. Section 26(2) of the MPRDA gives powers to the Minister of Mineral Resources to declare certain minerals deemed

critical for the development of the economy as strategic, thereby restricting their trade volumes to make provision for local industry. However, WTO prohibits the restriction of trade volumes, but the government can invoke Article XVIII: (2) of GATT, which temporarily allows developing countries to limit volumes on traded commodities as long as it can be proven that it is for developmental purposes.

South Africa can also leverage its preferential agreements, as it is a beneficiary of GSP from Japan and the US, which are among the leading consumer markets for fluorocarbon products. The country should also optimise its Regional Trade Agreements such as African Continental Free Trade Area (AfCFTA) agreement as an opportunity to supply a wider fluorocarbon market. The argument of access to markets and size has been identified quite often as a prohibiting factor for developing countries to manufacture beneficiated products. South Africa's local industries' demand for fluorochemical products is small relative to the country's mineral endowment. It would therefore be of utmost importance for the country to optimise BRICS, AGOA and other preferential agreements to access the fluorochemicals market.

### **6.3.1 Rationale for Establishing a Fluorochemicals Industry in South Africa**

The country is host to one of the largest deposits of fluorspar in the world and the suggested value chain is to leverage on the comparative advantage to ensure that feedstock material is supplied to the local processing industry at developmental prices. There is opportunity of growth that exists in the polymers and fluorochemicals industries on the back of the country's abundant fluorspar resources for downstream value addition. The fluorochemicals industry is a US\$ 22 billion market and South Africa holds 13.2 percent of the world's reserves, but only 3.6 percent of fluorspar production is beneficiated locally.

According to Robinson & Von Below (1990), the fourth stage of beneficiation, which include manufacturing of fabricated products, is labour-intensive compared to the first three stages and has the most potential in providing employment and developing skills. Leeuw (2012), also asserts that manufacturing has a high labour absorbency and is generally regarded as having a high potential to create opportunities for jobs. Development of the fluorochemicals industry will also drive R&D initiatives and foster collaboration between public and private sector research into new materials (Radebe, 2018).

From the analysis it is suggested that South Africa follows the fluorocarbon route since it has abundant feedstock material for security of supply and has the capacity to develop the skills necessary for the fluorochemical industry. Fluorocarbons account for about 63 percent of HF global consumption. The refrigerant and air conditioning gas markets account for almost half of the total fluorocarbon consumption globally.

The development of the fluorochemicals industry is aligned with the country's Industrial Policy Action Plan (IPAP) in terms of technology and downstream industry development. The fluorochemicals industry can provide a bridge between upstream mining and manufacturing industry by assisting in developing the requisite skills in producing high-end products in sectors such as the automotive industry.

South Africa already has an established plant handling and producing HF, Pelchem a subsidiary of Necsa, and can use this expertise to increase sales in the export markets. The production and availability of HF is an important component in the fluorochemicals value chain. The existing technology at Pelchem and customer base provides a cost advantage in back integration of fluorochemicals as the company is looking for an equity partner to commission a fluorochemicals plant at the Coega Special Economic Zone (SEZ) in the Eastern Cape. The SEZ has access to world-class modern

transport infrastructure, such as deep-sea harbour, rail and road access. There are opportunities for other HF plants to be established in the country given the growing demand for hydrofluoroolefins (HFOs), which will also lead to increase in HF consumption.

Africa is seen as the next future demand driver for fluorochemicals after Asia-Pacific region. There are currently no HFO plants in Africa and with the coming into effect of the African Continental Free Trade Area (AfCFTA), an HFO plant established in South Africa will have access to this market and beyond. The establishment of an HFO plant will be back integrated with a low cost of fluorspar, which will enable the company to stay competitive. Building a plant from a greenfield site will allow the producer to optimise the HF upstream capacity.

#### **6.4 Section C: Factors Undermining Beneficiation and Proposed Interventions**

For the establishment of a fluorochemicals industry to take effect in South Africa, certain constraints will have to be eliminated or managed such as:

- Import parity – there are reports of an international parity pricing mechanism for raw and intermediate materials used by some producers, which do not discount proximity to production sites. This will further compound the concern of reliable cheap access to input minerals for local value addition and would render downstream beneficiation uncompetitive. Ensuring feedstock security of supply can be addressed by developing appropriate infrastructure and competitively priced products.
- Energy – early-stage beneficiation programmes require large and uninterrupted supply of energy, something South Africa's energy utility, Eskom, has been struggling to consistently provide. However,

a reprieve was offered to the mining industry in February 2020, to allow operations to generate electricity for self-use.

- Trade barriers – some of South Africa's prospective recipients of beneficiated products tend to limit access to their markets. South Africa will need to develop broader mineral diplomacy programmes on existing trade agreements
- Distance to markets – Generally any particular good will be imported from the cheapest producer, but South Africa is a long haul distance country for trade. Government need improve logistical infrastructure to encourage mineral beneficiation closer to source.
- Production of HF is extremely hazardous and a plant will be required to invest in the corrosive HF recovery processes, while competing with large volume suppliers from China.
- Absence of HFO market in Africa – since there is currently no HFO market in Africa, a prospective plant will have to develop relationships with automakers and air conditioning equipment companies. It would be ideal for an HFO plant in South Africa to have upstream investments and several off-take agreements.
- High capital cost – a project of this magnitude will require assistance from the government to succeed. The government can offer investors investment packages that included favourable commercial loans and establishment of special economic zones with duty free and low tax rate for manufacturing.
- Skills deficit – the fluorochemical industry would require specialised skills set. Education and R&D programmes at universities would have to be aligned to address the industry's skills shortage.

#### **6.4.1 Human Resource Capacity and Research & Development**

Most developing countries tend to rely heavily on one sector of the economy that provides job security and generates revenue for the government for social development projects. The problem with the reliance on one sector of

the economy is that the country is heavily exposed to market externalities such as demand and price fluctuations of commodities. Economic diversification is key in advancing the developmental agenda of any country (OECD/United Nations, 2011). While countries should strive for diversification in their economies, what is important is to build capacity in processed and manufactured goods as they present high returns on incomes and provides sustainable jobs.

It has been noted that the prospect for value-added processing requires a different set of skilled labour compared to the current set of skills in most developing countries (Davis and Vasquez Cordano, 2013). This will also support the skills required for the next industrial era, that is the Fourth Industrial Revolution, which will be characterised by extreme automation and connectivity. The necessary skills base can be developed through professional and vocational training to absorb the shocks associated with the changing skills requirements. Developing countries such as South Africa need to strengthen higher education and training programmes in the mining industry to bridge the skills gap requirements to improve labour market efficiencies (Robinson and Von Below, 1990).

In an attempt to develop human capacity and technology in fluorinated products, South Africa started a Fluorochemical Expansion Initiative (FEI) programme in 2015. The key role players in the programme are government through various departments, viz., Department of Science and Innovation (DSI), Department of Trade, Industry and Competition (the dtic) and DMRE through its state-owned entity (Necsa – Pelchem). Other partners providing skills and research development are the University of Pretoria (Research Chair in Fluoro-materials Science and Process Integration), and University of KwaZulu-Natal (Research Chair in Fluorine Process Engineering and Separation Technology). The aim of the programme is to develop a fluorochemicals complex (F-Complex) in the country, which would increase local consumption of fluorspar. The programme will create highly skilled and

semi-skilled jobs, and create secondary value adding industries, which will reduce the country's reliance on fluorochemical imports.

The investment in human skills, research and development, and geological and geophysical data has been cited as critical for the efficient and effective management of mineral resources (African Union, 2009). Advancing mineral beneficiation in developing countries such as South Africa will further encourage resource-based economies to transition to knowledge-based economies as the world moves to an era of the fourth industrial revolution. This will ensure that there is continuation of economic progress long after the resources have been depleted.

## **6.5 Chapter Summary**

In Section A, the chapter discussed the impact of tariff escalation on trade of processed and manufactured goods from developing countries. While tariffs on mineral resources tend to be low, evidence has shown that tariff rates tend to increase with the degree of processing of a commodity. Tariff escalation on mineral commodities suppresses diversification and sustainable development in developing countries, as there is less incentive to beneficiate raw materials into manufactured products and value added activities.

In Section B, the chapter discussed the impact of tariffs on mineral trade and based the argument on establishing a fluorochemical industry in South Africa as a case study. In a bid to support the establishment of a local beneficiation industry, the application of export duties were proposed together with a hybrid model of tariff rates whereby bound rates would be applied on primary and semi-manufactured products, while the tariff rates would be relaxed on input materials required for downstream activities in the value chain. The proposal is suggested for the initial phases of establishment of the fluorocarbon industry in cognisance that the industry is



not yet at a position to produce some of the critical input materials. It is noted that even though increase in tariff rates for fluorspar products in a short-term might lead to a trade diversion, the long-term benefits will outweigh the negative impact by stimulating a downstream value addition industry for fluorspar products and derivatives.

In Section C, the chapter discussed the importance of developing countries developing skills and diversifying their economies, and not heavily relying on extractive industries. Most value and sustainable jobs are created downstream in the value addition chain. However, for developing countries to have a meaningful participation in this space they will have to invest in R&D and up-skilling their workforce.

## **CHAPTER 7: CONCLUSION AND RECOMMENDATIONS**

### **7.1 Conclusion**

This report conducted a trade flow analysis with a particular focus on mineral commodities to analyse the impact that international trade regimes have in advancing beneficiation of minerals in developing countries. It further looked at how developing countries could use mechanisms in the trade regimes to address issues of industry development in their countries. A case study of the South African fluorspar value chain was used to demonstrate how trade regimes could be considered as one aspect in development of downstream value chain activities.

Mineral resources are finite in nature and most developing economies endowed with mineral resources, export the bulk of their primary minerals and later import them as processed finished goods. Developing countries such as South Africa are endowed with mineral resources and, to a large extent, their economies are dependent on the export of these raw minerals. This phenomenon has led to low or lack of investment in downstream value addition facilities in many developing countries. Most developing countries' resources are traded in their raw form, which is problematic because primary commodities tend to be characterised by volatile prices, resulting in diminishing returns, lack of technological dynamism and local economic linkages.

The study looked at how tariff escalation with the level of processing creates a disincentive for raw materials producers, especially in developing countries, to further process their products as they often incur higher tariffs in export markets. It further suggests that changes in trade policies of importing countries could assist mineral producing countries to diversify their economies. Tariff protection in natural resources sector is low relative to other sectors, however, tariff escalation is significant in natural resources.

It was noted from the study that, in as much as there is a strong drive for developing countries to benefit from their raw minerals, few have internal markets large enough to justify the establishment of manufacturing enterprises on a scale that can make them economic. This is where regional integration may play an important role in consolidating local market demand to justify the case for beneficiation and product diversification. The research found that developing countries, especially African countries, do not trade sufficiently among themselves, intra-African trade is quite low compared to other continents and lacks diversification. With the operation of the AfCFTA coming into effect, the economies of scale will encourage producers of raw materials and manufacturers to benefit from products in the African continent and improve intra-continental trade. Trade for AfCFTA was expected to begin on 01 July 2020, but this will probably be postponed as the world battles with containing the novel coronavirus 2019 strain (COVID-19).

An assessment was conducted to analyse tariff escalation as an impediment for industrialisation in developing countries. A sample of 10 countries, which included both developed and developing countries was analysed to obtain a balanced representation. From the results, the majority of countries showed a tariff escalation with the stages of processing, but to varying degrees, with few exceptions where a tariff de-escalation from raw materials to semi-manufactured products was observed. From the analysis it was deduced that tariff escalation is not only a phenomenon applied by developed countries, developing countries also apply tariff escalation in their processed goods. However, the impact on global trade and economic development as a result of tariff escalation from developing countries is insignificant considering that most do not have capacity or industries producing the consumer products they import.

In a value proposition case study for South Africa's fluorspar industry to promote industrial growth, the report conducted a simulation exercise using the partial equilibrium modelling tool (SMART) from the World Bank, to

determine the best tariff structure that could be used to stimulate downstream beneficiation activity in the fluorspar value chain. Secondly, the report looked at the argument of using export taxes to ensure security supply of feedstock to local processing plants. Thirdly, the report looked at the WTO instruments, such as schedules of concession, PTAs and GSP that could be used by South Africa to gain access to the fluorocarbon markets in developed countries.

From the simulation results, it was suggested that South Africa implement a hybrid model of imposing higher import tariffs on fluorspar feedstock and relaxed duties on input materials necessary for downstream value-addition activities, while it is developing infrastructure and capacity. From running the model it was noted that with increase in tariffs the fluorspar industry might experience trade diversion in the short-term, but in the long-run this protective measure of the domestic industry will stimulate downstream value addition activities. The government could also protect the initial phase of the configuration of the fluorochemical industry by ensuring that revenue collected from custom duties as a result of tariff increases is ring-fenced in developing capacity in downstream value addition activities in the fluorocarbon industry. It is acknowledged that tariffs alone would not stimulate the development of the fluorspar downstream value chain in South Africa, other factors which provide an enabling environment for investment would also have to be considered:

- Improving logistical infrastructure and access to foreign markets;
- Developing special economic zones with duty-free and low tax rates for manufacturing;
- Lowering the cost of capital in SA;
- Access to intermediate inputs at world competitive prices (e.g. chloroform);
- Offering incentives to R&D projects; and

- Offering investment packages that include favourable commercial loans.

In the second construct to address the issue of international parity pricing that has been reported to have been applied by producers, it was suggested that the government could introduce export taxes to ensure security of supply of raw materials for downstream beneficiation activities. Import parity pricing on key intermediate inputs into the manufacturing sectors continues to constitute a major constraint to industrialisation. To avoid contravening any WTO stipulations the government could invoke article XX: (i) and XVIII: (2) of GATT, which deals with exceptions involving restrictions on exports of domestic materials necessary to ensure essential quantities of a resource for domestic developmental needs.

### **Key Findings**

- It is important to make a distinction between mining beneficiation and manufacturing beneficiation. Manufacturing beneficiation is driven by competitive advantage issues, such as skills, technology and productivity among others, and not necessarily comparative advantage.
- Tariff escalation on the level of processing for mineral commodities is applied by both developed and developing countries. However, the phenomenon would have the most dire consequences on developing countries, as they are still in developmental stages and it would be difficult for their processed goods to penetrate established markets in developing countries. This might also lead de-industrialisation in developing countries of the already established manufacturing industries.
- International trade regimes do have an impact on the level of beneficiation in developing countries. The implementation of a hybrid tariff structure as proposed for the case study of South Africa can

stimulate downstream beneficiation activities in the fluorspar value chain. Developing countries can use trade regimes to protect their infant industries.

- From the analysis it was found that South Africa is among the countries that impose the lowest tariffs on input materials required for manufactured products in the fluorochemicals industry.

## **7.2 Recommendations**

- Developing countries need to shift from a mindset of comparative advantage to competitive advantage (skills, technology, TS&D and R&D) to develop their downstream value chains.
- While it is noted that comparative advantage does not translate into competitive advantage, there should be an urgency to drive and assist developing countries to transition from heavy reliance on extractive sectors and diversify their economies into knowledge based economies. Most value and sustainable jobs are created downstream in the value addition chain. Furthermore, this will ensure that there is continuation of economic progress long after the resources have been depleted.
- Lobby the WTO to exempt processed mineral commodities from developing countries entering developed countries' markets from tariff escalation. This will assist developing countries to work towards diversifying their economies and start becoming self-sufficient, and ultimately stop relying on aid from developed countries.

## **7.3 Limitations and Areas for Further Study**

- The analysis and scope of the report was limited to tariffs. However, it is acknowledged that access to international markets is not only limited to tariffs, factors such as implications for commercial competitiveness are equally important.

- The report focused mainly on downstream beneficiation due to the project timeline. This does not imply that other forms of beneficiation are less important. Further study can replicate this research to include other beneficiation linkages.
- The framework of this study can be applied on other mineral value chain streams identified by the beneficiation strategy, such as the steel and chrome value chains.
- There is a need for further study on the impact of AfCFTA on creating opportunities for mineral beneficiation on the continent.

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## APPENDICES

Table A 1: Tariff Rates on Natural Resource Sectors, 2018

Sector	Duty Type	Developed Countries	Developing Countries	All Countries
Mining	AHS	0.94	2.72	2.61
	BND	10.74	30.55	27.35
	MFN	1.43	3.09	3.98
Fishery	AHS	2.95	10.20	7.38
	BND	13.08	38.49	33.98
	MFN	3.29	15.52	13.56
Forestry	AHS	5.11	5.89	5.52
	BND	13.75	40.27	40.14
	MFN	3.51	5.84	5.93
Fuels	AHS	1.30	3.14	3.22
	BND	11.65	33.81	28.46
	MFN	1.70	4.04	4.57
All Merchandise Imports	AHS	2.54	7.50	6.56
	BND	15.68	34.49	32.29
	MFN	3.12	8.54	8.76

Source: WTO IDB accessed through the (World Bank, 2020)

Notes: The nomenclature used is SIC except for fuels, SITC Revision 4

Table A 2: Leading Importing Countries of South Africa's Acidspar by Value, 2015 – 2019

Importers	Exported value in 2015	Exported value in 2016	Exported value in 2017	Exported value in 2018	Exported value in 2019
<b>World</b>	<b>358 850</b>	<b>397 445</b>	<b>687 744</b>	<b>881 189</b>	<b>556 818</b>
Netherlands	107 584	143 200	121 198	190 555	291 103
Italy	82 825	43 776	126 640	69 333	132 987
United Arab Emirates	0	38 193	56 049	268 670	67 980
United States of America	87 746	95 584	78 041	195 742	64 444
Lesotho	0	0	0	0	289
Thailand	0	0	0	0	14
China	0	0	40 151	33 771	0
India	15 867	56 761	179 642	122 406	0
Spain	23 097	19 932	479	395	0
Tunisia	41 730	0	77 828	0	0

Source: (Trade Map, 2018) and (World Trade Organization Integrated Database, 2020)

Table A 3: Leading Importing Countries of South Africa's Metspar by Value, 2015 – 2019

Importers	Exported value in 2015	Exported value in 2016	Exported value in 2017	Exported value in 2018	Exported value in 2019
<b>World</b>	<b>127</b>	<b>46 180</b>	<b>5 109</b>	<b>42 869</b>	<b>34 640</b>
United States of America	0	0	0	132	32 056
India	0	0	4 949	513	2 367
China	0	0	0	2 831	115
Zimbabwe	0	0	13	13	29
Australia	0	0	13	0	14
Ghana	0	0	0	0	14
Kenya	0	0	0	0	14
Senegal	0	0	0	0	14
Tanzania, United Republic of	0	0	0	0	14
Zambia	25	0	0	0	14

Source: (Trade Map, 2018) and (World Trade Organization Integrated Database, 2020)

Table A 4: MFN Tariff Escalation on Industrial Products in Selected Developed and Developing Countries, 2018

Import markets	Stages of Processing	Mineral Products	Metals	Fuels	Chemicals
Canada	Raw materials	0.19	0		0
	Semi manufactures	0	0.02	0.17	
	Finished products	2.42	2.36	2.86	0.33
United States	Raw materials	0.34	0.09		0
	Semi manufactures	1.04	1.16	3.03	
	Finished products	3.59	2.41	1.86	6.4
China	Raw materials	4.31	1.14		0
	Semi manufactures	8.1	5.11	6.19	
	Finished products	14.5	10.94	7.68	6.18
Brazil	Raw materials	3.68	2.76		0
	Semi manufactures	4.86	9.56	7.68	
	Finished products	12.33	15.96	10.93	0.28
Russia	Raw materials	6.09	3.03		1.43
	Semi manufactures	10.13	6.07	4.77	
	Finished products	11.59	8.97	5.83	5
European Union	Raw materials	0.17	0		0
	Semi manufactures	2.2	1.53	4.97	
	Finished products	3.39	2.88	3.01	2.99
Australia	Raw materials	0.43	0		0
	Semi manufactures	0.79	3.04	1.49	
	Finished products	3.3	4.24	2.96	0
India	Raw materials	10.07	5.61		5
	Semi manufactures	9.28	11.32	9.95	
	Finished products	11.97	11.87	10.89	10
Japan	Raw materials	0.21	0		0
	Semi manufactures	0.36	1.03	2.45	
	Finished products	1.59	1.1	1.3	0.72
South Africa	Raw materials	0.21	0		0
	Semi manufactures	0.36	3.85	1.33	
	Finished products	1.59	9.33	5.74	0

Source: (World Bank, 2020c)

Table A 5: Origin of South Africa's Imports of Fluorochemicals, 2019

Country	Commodity	Value (US\$'000)	AHS	MFN	BND
China	Acidspar	86	0.00	0.00	0.00
	Hydrofluoric acid	117	0.00	0.00	10.00
	Mixtures containing HFCs	13219	0.00	0.00	15.00
	Mixtures containing CFCs	1	2.67	2.67	14.00
	Mixtures containing HCFCs	133	2.00	2.00	13.33
	Mixtures containing PFCs	7455	0.00	0.00	12.50
	PTFE	1060	0.00	0.00	15.00
USA	Hydrofluoric acid	2	0.00	0.00	10.00
	Fluorine	7	0.00	0.00	10.00
	Mixtures containing HFCs	2540	0.00	0.00	15.00
	Mixtures containing CFCs	2	2.67	2.67	14.00
	Mixtures containing PFCs	1	0.00	0.00	12.50
	PTFE	217	0.00	0.00	15.00
United Kingdom	Metspar	345	0.00	0.00	0.00
	Fluorine	0	0.00	0.00	10.00
	Mixtures containing HFCs	974	0.00	0.00	15.00
	Mixtures containing CFCs	1	0.67	2.67	14.00
	PTFE	314	0.00	0.00	15.00
Netherlands	Mixtures containing HFCs	209	0.00	0.00	15.00
	PTFE	1267	0.00	0.00	15.00
India	Metspar	21227	0.00	0.00	0.00
	Fluorine	22889	0.00	0.00	10.00
	Mixtures containing HFCs	524	0.00	0.00	15.00

Country	Commodity	Value (US\$'000)	AHS	MFN	BND
	Mixtures containing CFCs	23995.839	2.67	2.67	14.00
	Mixtures containing HCFCs	24549.522	2.00	2.00	13.33
	Mixtures containing PFCs	355	0.00	0.00	12.50
	PTFE	30	0.00	0.00	15.00
<b>Mexico</b>	Metspar	720	0.00	0.00	0.00
<b>Israel</b>	Mixtures containing HFCs	659	0.00	0.00	15.00
<b>Italy</b>	Mixtures containing CFCs	548	0.67	2.67	14.00
	PTFE	1	0.00	0.00	15.00
<b>Germany</b>	Hydrofluoric acid	158	0.00	0.00	10.00
	Fluorine	6	0.00	0.00	10.00
	Mixtures containing HFCs	107	0.00	0.00	15.00
	Mixtures containing CFCs	2	0.67	2.67	14.00
	Mixtures containing HCFCs	1	0.00	2.00	13.33
	Mixtures containing PFCs	12	0.00	0.00	12.50
	PTFE	1	0.00	0.00	15.00
<b>Singapore</b>	Mixtures containing HFCs	41	0.00	0.00	15.00
	Mixtures containing PFCs	170	0.00	0.00	12.50

Source:(World Bank, 2020b)

Table A 6: South Africa's Proposed Tariff structure for Fluorochemical Products

Commodity	Old tariff	Proposed tariff	Imports Before in 1000 USD	Import Change	Tariff Revenue in 1000 USD	Tariff New Revenue in 1000 USD	Tariff Change In Revenue in 1000 USD	Consumer Surplus in 1000 USD
<b>Metspar (252921)</b>	0	5	963.74	-67.42	0.00	44.82	44.82	-1.69
<b>Acidspar (252922)</b>	0	5	39.07	-4.20	0.00	1.74	1.74	-0.11
<b>HF (281111)</b>	0	5	231.62	-8.71	0.00	11.15	11.15	-0.22
<b>Fluorine (280130)</b>	0	1	231.62	-1.74	0.00	2.30	2.30	-0.01
<b>Fluorinated hydrocarbons (290339)</b>	0	0	19795.94	0.00	0.00	0.00	0.00	0.00
<b>Mixtures of CFCs (382471)</b>	1.42	1	23.41	0.09	0.33	0.24	-0.10	0.00
<b>Mixtures of HFCs (382474)</b>	1.75	1	76.39	0.56	1.34	0.77	-0.57	0.01
<b>PFCs (382478)</b>	0	0	7681.84	0.00	0.00	0.00	0.00	0.00
<b>PTFE (390461)</b>	0	0	3447.65	0.00	0.00	0.00	0.00	0.00

Source: Author's simulation generated through the Single Market Partial Equilibrium Simulation Tool (World Bank)



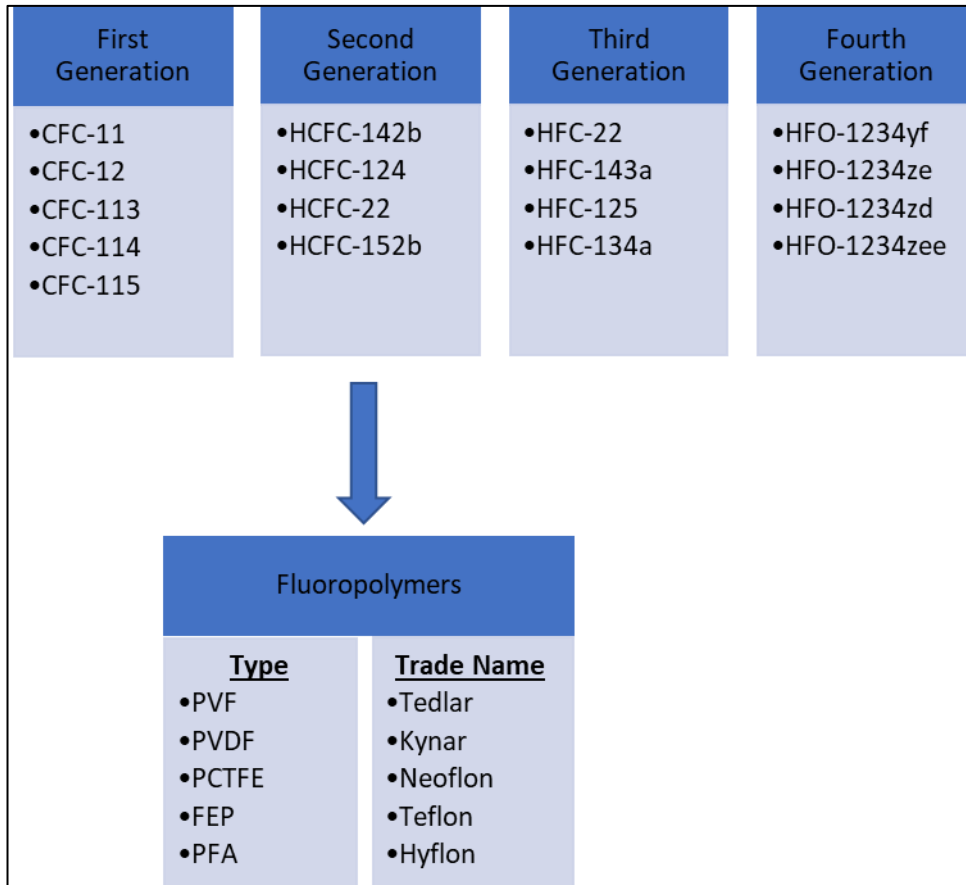


Figure A 1: Fluorocarbon Products

Source: Adapted from DMR, 2016b



Figure A 2: Map of Generalized System of Preference for South Africa

Source: (World Trade Organization, 2020b)