



**An evaluation of the factors affecting export performance and value addition for Platinum Group Metals (PGMs): The case of Zimbabwe after the adoption of the multicurrency system 2009 - 2015.**

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## **DEDICATION**

I dedicate this piece of work to my wife Jane and children: George, Prince and Tatenda who provided the much needed support. I also thank my parents, who taught me how to seek knowledge. To the Lord Our God is the Glory!!!!

## DECLARATION

I, Abisha Mujuru, do hereby declare that this dissertation is the result of my own investigation and research, except to the extent indicated in the Acknowledgements, References and by comments included in the body of the report, and that it has not been submitted in part or in full for any other degree to any other university.

Signature.....

Date .....

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## **EXECUTIVE SUMMARY**

This study was aimed at identifying and evaluating the factors that affect the export performance of platinum group metals (PGMs) in Zimbabwe, as well as establishing the constraints and enablers to PGMs beneficiation in the country after the introduction of the multicurrency system in 2009. The study sought to address the problem of how to address the persistent balance of payments (BOP) deficit that the nation has been experiencing, through identifying the factors that need to be addressed in the PGMs mining sector as the major flagship. Addressing the problem and making appropriate recommendations sought to enhance the sector's export performance and beneficiation in the medium to long term.

The research objectives were: to identify and evaluate the supply side factors affecting PGMs export performance; to identify and evaluate the demand side factors affecting PGMs export performance and to establish the constraints and enablers of PGMs value addition in Zimbabwe and proffering appropriate recommendations. The research was carried out through a qualitative combined case study. The data was gathered through in-depth interviews with representatives from the mining entities and the Ministry of Mines and Mining Development providing the key information.

The research findings identify supply side themes as being operational factors, firm characteristics, industry factors, the macroeconomic factors and government regulations. Demand side factors evaluated were: access to export markets, entry barriers, competition, and the pricing structures. Value addition factors were raw materials, infrastructure, electricity and water availability, research and development, skills levels and market access. A number of factors such as abundant raw materials, low risk, ownership structures, and favourable exchange control regime and mining incentives were found to be export performance and beneficiation enablers. Electricity shortages, skills shortages, distribution channels, high interest rates and infrastructure shortcomings came up contributing negatively to export performance and beneficiation. The major recommendations were to resolve the electricity challenges, invest in infrastructure development, invest in relevant skills training and development, increase production and suspend the tax on non-beneficiated platinum in order to enhance export performance and long term beneficiation.

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## LIST OF ABBREVIATIONS

BMR	Base Metal Refinery
BOP	Balance of Payments
CAPEX	Capital expenditure
GDP	Gross domestic product
IMF	International Monetary Fund
Mimosa	Mimosa Mining Company Limited
M.O.M	Ministry of Mines and Mining Development
NRZ	National Railways of Zimbabwe
Oz	Troy Ounce
PGMs	Platinum group metals
PMR	Precious metal refinery
R&D	Research and Development
RBZ	Reserve Bank of Zimbabwe
SIB	Stay in business expenditures
SML	Special mining lease agreement
SWOT	Strengths, Weaknesses, Opportunities and Threats
Unki	Unki Mines (Private) Limited
VAT	Value added tax
ZESA	Zimbabwe Electricity Supply Authority
Zimplats	Zimbabwe Platinum Mines (Private) Limited
ZIMRA	Zimbabwe Revenue Authority

## **CHAPTER 1**

### **INTRODUCTION TO THE STUDY**

#### **1.1 INTRODUCTION**

This study was motivated by the need to determine and evaluate the factors that influence export performance of the mining sector in general and the platinum group metals sector in particular. The mining sector was significant as it contributed fifty three percent (53%) of the total exports in Zimbabwe in 2014 (Reserve Bank of Zimbabwe, 2015), with the platinum group metals subsector contributing above a quarter of the total mining exports. The study thus investigated and evaluated the factors that have positive and negative effects on the export performance of platinum group metals (PGMs) in Zimbabwe. The performance of the mining sector has the potential to improve the balance of payments (BOP) for the Zimbabwean economy, which has been negative over the past five years. Accordingly, being aware of the export performance determinants in the PGMs sector creates a platform for addressing the negative factors and building on the positive factors so as to improve the economic performance of the country.

The study discussed the structure of the platinum mining entities in Zimbabwe, their current production capacity and platinum group metals resources the country is endowed with. Zimbabwe is the second largest host of platinum group metals after South Africa, with an estimated 53.7 million tonnes in reserves, constituting 13% of the total world reserves (Anglo American, 2013). This indicates that the sector has great potential to boost its performance and ultimately improve the country's exports and balance of payments. The levels of beneficiation and factors that are at play in that respect also form the core part of the study. The study gathered data from the existing mining entities, namely Zimplats, Mimoso and Unki Mines as well as policy and overall industry information from the Ministry of Mines and Mining Development, in order to come up with the determinants of exports performance and beneficiation within this sector.

#### **1.2 BACKGROUND TO THE STUDY**

##### **1.2.1 Characteristics and significance Platinum group metals (PGMs)**

Since this study will focus on the platinum group metals mining subsector, it is important to start by discussing what these metals are, their uses and global demand and supply. The

discussion will touch on what platinum group metals are, the metals making up the group as well as the uses and applications of the PGMs, the demand and supply for the metals and their significance in the global economy.

#### **1.2.1.1 What are Platinum group metals?**

Platinum Group Metals (PGMs), comprise of six elements which are chemically very similar, namely: Platinum (Pt); Rhodium (Rh); Palladium (Pd); Ruthenium (Ru); Iridium (Ir) and Osmium (Os). PGMs normally exist in association with other metals such as Gold (Au), Copper (Cu), Cobalt (Co), Nickel (Ni) and Silver (Ag) (Polinares, 2012). Platinum, palladium and rhodium are the most commonly used of the PGMs and are available in large quantities hence they are the most economically significant elements within the group. The other PGMs are co-products of the three main elements, osmium is rarely used.

**Platinum** is a precious silvery-white metal, with the chemical element of atomic number 78. Platinum was first encountered by the Spanish in South America during the 16th century who named the element “Platina” that is little silver (Polinares, 2012). Platinum has the widest uses among the PGMs. Platinum is one of the heaviest and densest metals, is very ductile, malleable and very durable. The metal is a good conductor of electricity, is corrosion resistant and a strong catalysing agent.

**Palladium** also has a silvery white lustre and is as abundant as platinum compared to other PGMs. Palladium is the lightest of the PGMs. The unique characteristic of palladium is its capability to absorb huge amounts of hydrogen. Palladium’s major applications are in alloys, plating, and as a catalyst. It is also a suitable platinum substitute in catalysts, jewellery and electrical contacts.

**Rhodium** has lower density and a higher melting point than platinum. It is also a silvery white metal which is durable, hard, and corrosion resistant with a high reflectance. Rhodium is a major element used in industrial catalysis systems. When moulded in alloys with other metals Rhodium is also used in furnace windings, bushings in glass manufacture, and crucibles used in laboratories.

### 1.2.1.2 Uses of PGMs

PGMs have a variety of uses in numerous industries which includes: the automobile industry where the metals are used in catalytic converters, sensors and spark plugs, in the glass industry, platinum is used in forms and channels fabrication in glass manufacture. The electronic sector use the PGMs in computer hard drives manufacture and other electronics products. In the petrochemical industry, the metals are used in oil refinery catalysts, silicones and chemical catalysts. The other uses of the precious metals are in drugs and biomedical components, as catalyst and in the fertiliser manufacture by the chemical industry, as plating connectors and conductors. The PGMs are also used for jewellery manufacture and for investment purposes.

The leading consumer of the PGMs is the auto-catalysts sector in which they are used for the reduction of pollution by reducing petrol and diesel engine emissions (Anglo American, 2015). Table 1.1 below shows the uses and annual demand for five of the PGMs, in million troy ounces (Oz), the element osmium is rarely used hence it is not included below.

**Table 1.1 Global demands for PGMs per application (million ounces)**

Use	Platinum	Palladium	Rhodium	Ruthenium	Iridium
Auto-catalysts	3.125	5.450	0.724		
Chemical	0.445	0.395	0.068	0.100	0.018
Dental		0.580			
Electrical	0.220	1.410	0.004	0.754	0.194
Glass	0.345		0.057		
Investments	0.650	1.085			
Jewellery	2.415	0.620			
Bio Medical	0.255				
Petroleum	0.170				
Electrochemical				0.132	0.082
Other	0.255	0.085	0.020	0.043	0.040
<b>Total Demand</b>	<b>7.880</b>	<b>9.625</b>	<b>0.873</b>	<b>1.029</b>	<b>0.334</b>

Source: Johnson Matthey (2013)

Table 1.1 shows that the PGMs have a number of uses worldwide with the auto-catalyst industry being the biggest consumer requiring 3.125 million ounces of platinum and 5.45 million ounces of palladium annually. The metals are also used in other manufacturing processes to a lesser extent; the industries include electrical, chemical, dental, petroleum, for jewellery, in medicine and as investments. The high demand for the PGMs is significant for the Zimbabwean platinum miners as there is a ready market for the products, there is therefore potential for the mining entities to boost production and revenues.

Since the **auto catalyst sector** is the major consumer of the three main PGMs it is critical that a discussion to understand what it is undertaken. An auto catalyst is a cylindrical metal or ceramic section formed in a honeycomb coated with chemical solution of platinum, palladium and rhodium combination. The purpose of the auto catalyst is to control emissions from automobiles. The auto catalyst is encased into a canister of stainless steel, and the full assembly is known as catalytic converter. The catalytic converter is mounted in the automobile's exhaust line between the silencer and engine (Johnson Matthey, 2013). Appendix 2 shows an image of the catalytic converter.

The auto catalyst converts combustion pollutants into harmless gases and water. There is sustained demand from the auto catalyst industry as more than 90% of all new vehicles are fitted with the auto catalytic converter (Johnson Matthey, 2013). In addition, a number of countries such as the USA, Japan, other European nations as well as China and India have enacted legislation making the installation of the catalytic converters mandatory. The catalytic converter can also be recovered for recycling when motor vehicles are scrapped. Recycling has had impacts on the supply of the PGMs to the consumers supplementing new extraction and production; hence it is also critical to determine the impact of recycling on production, prices and exports.

### **1.2.1.3 Demand of PGMs per country or region**

The demand for platinum, palladium and rhodium comes mainly from major economies which include Europe, Japan, North America and China. Table 1.2 below indicates the consumers of platinum and palladium in million ounces.

**Table 1.2 Key consumers of Platinum and Palladium**

<b>Country/ Region</b>	<b>Platinum</b>	<b>Share (%)</b>	<b>Palladium</b>	<b>Share (%)</b>
Europe	2.110	26.6	1.730	18.0
Japan	1.155	14.7	1.475	15.3
North America	1.505	19.1	3.055	31.7
China	1.985	25.2	1.815	18.9
Rest of the World	1.125	14.3	1.550	16.1
Total Demand	7.880	100	9.625	100

**Source: Polinares (2014)**

Table 1.2 indicates that the European region accounts for the highest demand for platinum accounting for 26.6% while North America accounts for 31.7% of palladium, the rise of China is anticipated to increase the annual demand for the precious metals as it is currently the second largest consumer of the metals accounting for 25.2% and 18.9% of platinum and palladium respectively.

As mentioned above the sustained demand creates potential for Zimbabwe to contribute to the global supply in a way that will increase the exports of the PGMs. The major concern however, is that Zimbabwe is currently not exporting a significant amount of the precious metals to the global market compared to South Africa and Russia. Therefore it is critical for Zimbabwe to increase PGMs exports to significant levels in order for the nation to benefit from high export performance.

#### **1.2.1.4 Key producers of PGMs**

The major producer country of PGMs in 2012 was South Africa with most of the resources coming from the Bushveld Complex also referred to as the Merensky Reef contributing 76.3%, followed by Russia with 13.6%. Zimbabwe contributed only 4.6% of the PGMs supply regardless of the fact that it has the second largest resource after South Africa (Polinares, 2013). Table 1.3 summarises the supply of platinum (platinum is in this case used as the proxy of all PGM elements) worldwide in million ounces (M oz.).

**Table 1.3 Key producers of Platinum (million ounces)**

<b>Country / Region</b>	<b>2011 (M oz.)</b>	<b>Share (%)</b>	<b>2012 (M oz.)</b>	<b>Share (%)</b>
South Africa	4.635	76.9	4.635	76.3
Russia	0.785	13.0	0.825	13.6
North America	0.260	4.3	0.210	3.5
Zimbabwe	0.230	3.8	0.280	4.6
Others	0.115	1.9	0.110	1.8
<b>Total</b>	<b>6.025</b>		<b>6.060</b>	

**Source: Polinares (2014)**

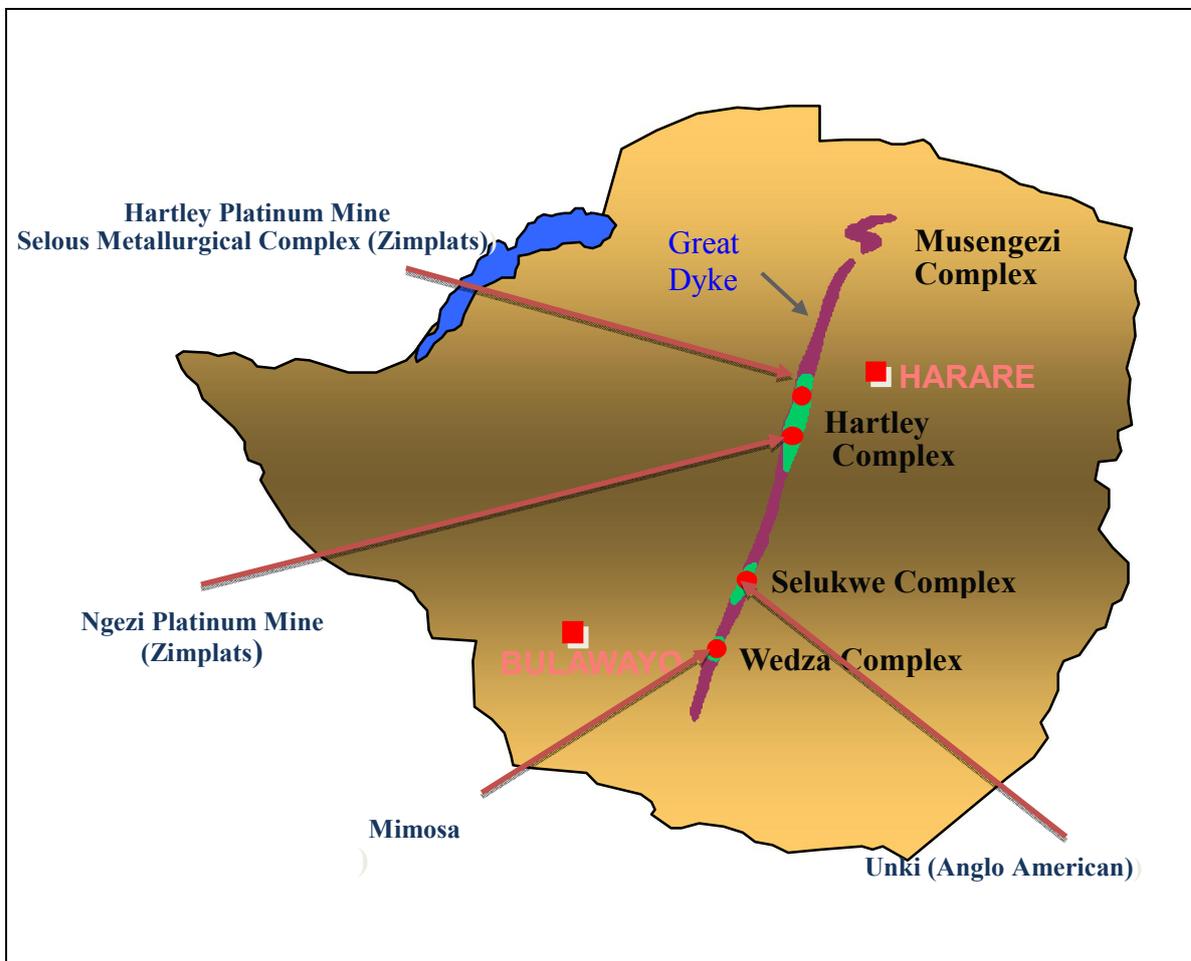
Table 1.3 indicates that South Africa is the world's largest producer of platinum followed by Russia the two countries contributed 76.3% and 13.6% of platinum output in 2012 respectively. Zimbabwe only managed to supply 4.6% of platinum in 2012. The top five producing companies of the PGMs in the world, according to Johnson Matthey (2013), are Anglo American Plc (Anglo American). through its subsidiary Anglo Platinum (26.73%), Norilsk Nickel Mining and Metallurgical Company (26.45%), Impala Platinum Limited (Impala) (17.31%), Lonmin Plc (10.63%) and Aquarius Platinum Ltd (3.52%). Therefore for Zimbabwe there is potential for growth in production if the mines embark on expansion projects given that three of the mining entities namely Impala, Anglo American and Aquarius all have foot prints in the country. Increases in production levels will ultimately increase the exports performance of the platinum sector, hence improving the balance of trade.

The major concern is therefore how Zimbabwe is able to improve production and ultimately PGMs exports to levels that are in tandem with its resource base. The breakthrough lies on identifying the determinants and factors affecting the export performance. Improving the exports will assist in improving the balance of payments situation for the country which is a crucial given the negative balance of payments prevailing in the country.

### 1.2.1.5 Number and depth of PGMs mines in Zimbabwe

The platinum group metals (PGMs) are found along the great dyke of Zimbabwe as depicted by the geological map in Figure 1.1 below. Currently there are three PGMs operating mines in Zimbabwe, namely Zimplats, Mimosa and Unki. There are also various claims owned by the Zimbabwe Mining Development Corporation (ZMDC) which are not yet operational. The industry is therefore very thin compared to South Africa where there are in excess of twenty five operating platinum group metals mines (Johnson Matthey, 2013).

**Figure 1.1: Geological Map showing the PGMs mines in Zimbabwe**



**Source: Chamber of Mines (2013)**

In order to increase the significance of Zimbabwe's contribution to global supply, there is great potential for increasing the production levels among the three entities which are currently as per table 1.4 below:

**Table 1.4 Production capacities for PGMs mines in Zimbabwe 2013 (Platinum ounces per year)**

<b>Company</b>	<b>Current capacity</b>	<b>Percentage (%)</b>
Zimplats	270 000	61
Mimosa	110 000	25
Unki	60 000	14
<b>Total</b>	<b>440 000</b>	<b>100</b>

**Source: Chamber of Mines (2013)**

As shown by Table 1.4, Zimplats is the largest producer of platinum locally accounting for 61%, while Mimosa is second with 25%, and Unki accounts for 14% of the production in Zimbabwe. The major expansion drives by the three entities when adequately supported with the required capital, skills and power are bound to increase production level and as a result export performance. For the 2014 financial year the export earnings for the three mines (based on their annual reports) were \$576 million for Zimplats, Mimosa realised \$261m while Unki realised \$142m. The combined total of \$979 million was 51% of the total mining exports indicating the significance of this sub sector.

There are only three PGMs mining entities in Zimbabwe producing 440 000 ounces of platinum annually. The sector is therefore not broad and is oligopolistic with Zimplats being the major producer of the PGMs with 61% of total production while the other two produce 39%. The concern is therefore how to broaden and expand the base of participants in the sector and increasing the output produced by the existing firms to be significant in the global market. This is supported by the mineral reserves and the existence of PGMs claim holders mainly ZMDC joint ventures that are not yet operational.

#### **1.2.1.6 Profiles of the PGMs mining entities in Zimbabwe**

Zimbabwe Platinum Mines (Private) Limited (Zimplats) is a Zimbabwe registered company that is wholly owned by Zimplats Holdings Limited which is registered in Guemsey and listed on the Australian Stock Exchange. Zimplats Holdings Limited is 87% owned by platinum giant, Impala Platinum Holdings Limited of South Africa. Zimplats is the largest PGMs mining entity in Zimbabwe producing 61% of total PGMs. It is located

in Ngezi and Selous where it operates four mines, three concentrators and one smelter. The company has a workforce of 3 268 employees.

Mimosa Mining Company Limited (Mimosa) is a jointly owned on by Implats and Aquarius Mining Company. Mimosa is the second largest producer of PGMs in Zimbabwe accounting for 25% of total PGMs output. The entity is located in Zvishavane and operates two mines and one concentrator. The company employs a workforce of 1 682.

Unki Mines (Private) Limited (Unki) is a subsidiary of Anglo American Platinum Limited of South Africa. Unki currently produces 14% of Zimbabwe's total PGMs annual output. Unki was established in 1989 and started production in 2011. The company is located in Shurugwi and currently operates one mine and one concentrator. The company employs a workforce of 1271.

#### **1.2.1.7 Beneficiation levels for Zimbabwean PGMs mines**

Mineral beneficiation is the value addition process on minerals which runs from exploration, extraction, concentration, refining and the manufacture of the final products for consumption. PGMs involve the five processes of exploration, mining, concentration, smelting and refining, the beneficiation flow process for PGMs is depicted in Appendix 3. Zimplats is the only one among the three operating entities that prospect, mine, concentrate and smelt its PGMs resulting the exportation of PGMs converter matte to South Africa for the refinery process through the base metals refinery and precious metals refinery (Chamber of Mines, 2013). Mimosa and Unki are only involved in prospecting, mining and concentration, thereby exporting PGMs concentrates for smelting and refinery processes in South Africa.

The potential for further beneficiation exists with consultations and background work already in progress to make this a reality, however it must pointed at this juncture that smelters and refineries are mega projects that require substantial capital injection and also require sustainable feedstock and adequate energy supply (Chamber of Mines, 2014). In order to encourage beneficiation the government has enacted the levying of fifteen percent (15%) tax on un-beneficiated platinum. This tax will affect the two mines that are exporting concentrate since the current beneficiation level that the PGMs must be processed up to, without effecting the tax is the smelting stage. Zimplats is the only entity

processing up to the converter matte stage. The impact of the fifteen percent tax on export performance and sustainability is worth exploring.

### 1.2.1.8 Zimbabwe PGMs sector SWOT analysis

SWOT analyses involve assessing the organisations and the internal and external environments, thereby resulting in the identification of the strengths, weaknesses, opportunities and threats (Ahmed, 2006). Table 1.5 below summarises the strengths, weaknesses, opportunities and threats that are faced by the PGMs sector in Zimbabwe.

**Table 1.5 PGMs sector SWOT analysis summary**

<p><b>Strengths</b></p> <p>Extensive reserves of PGMs</p> <p>Advanced mining and processing operations</p> <p>Competent and loyal workforce</p> <p>Developed international markets</p>	<p><b>Weaknesses</b></p> <p>Inadequate finance to fund expansion projects</p> <p>Limited geographic reach and international linkages</p>
<p><b>Opportunities</b></p> <p>Expansion through new projects</p> <p>Increasing beneficiation (downstream and side stream)</p> <p>Booms in international metals prices</p> <p>New uses for PGMs</p>	<p><b>Threats</b></p> <p>Unfavourable economic conditions</p> <p>International competition</p> <p>Indigenisation and Economic empowerment policies</p> <p>Precious metals prices declines</p> <p>Export tax on beneficiated PGMs</p>

### 1.2.2 The importance of mining exports to the economy

Exports play a pivotal role in the growth and development of a nation. The Zimbabwean economy has been experiencing balance of trade and balance of payments deficits due to the failure of the country's exports to surpass the level of imports. The mining sector, like all other sectors experienced a number of challenges during the period between 2001 and 2008. The hyperinflationary environment resulted in liquidity and capitalisation problems making it difficult for the mining houses to embark on critical capital projects that provide the capacity for growth and improvement in production (Zimbabwe Chamber of Mines, 2014). In February 2009 following the pronouncement by the then acting Finance Minister the country adopted the multicurrency system which assisted in restoring macroeconomic stability and provided the springboard for recovery.

The mining sector accordingly was on a recovery path following the adoption of the multi-currency system from 2009, registering positive growths of between 2009 and 2012 in terms of exports earnings as depicted in Table 1.6 below.

**Table 1.6 Zimbabwe's mineral exports and total export earnings: 2009 – 2014**

	2009	2010	2011	2012	2013	2014
Mineral exports (\$M)	660	1,569	2,127	2,189	2,055	1,906
Total exports (\$M)	1,613	3,244	4,416	3,808	3,694	3,621
Mineral exports / Total exports	41%	48%	48%	57%	56%	53%
Mining exports growth rate		138%	36%	2.9%	-6.1%	-7.3%
Total exports growth rate		101%	36%	-14%	-3%	-2%

**Source: Reserve Bank of Zimbabwe (2015).**

As depicted on Table 1.6 above, the mining sector is a major contributor to the country's total exports, contributing an average of 51% of total exports between 2009 and 2013. The sector contributed 53% of total exports in 2014. The mining sector is therefore a vital pillar to the economic performance of the Zimbabwe, hence there is need to ensure that the sector performs well in order to improve the country's total performance. The mining exports grew by 138% and 36% in 2010 and 2011 whereas the total exports increased by 101% and 36% respectively during the same period. In the year 2012 the increase in

mining sector exports earnings was a marginal 2.9% with the total exports registered a negative 14% growth rate. The last two years 2013 and 2014 saw the mining sector registering decreases in the exports earnings of 6% and 7% respectively, during the same period total exports declined by 3% and 2% for 2013 and 2014 respectively.

The trend in levels of mining exports and total exports is a cause of concern, hence there is need to address the factors contributing to the declining export performance and this study will focus on the mining sector as it contributes slightly more than half of the total exports for the nation. It is apparent that improvements in the mining sector exports will have positive impact on total export for the nation. The concern is thus what should be done to achieve sustained growth in mining exports hence significant improvements in the balance of payments situation.

### **1.2.3 Economic performance of the mining sector since 2009**

The mining sector has increased its contribution to the Gross domestic product since 2009. The trend indicates that the sector is key and significant for the economy. Table 1.7 shows the annual GDP growth rates for the Zimbabwean economy and the mining sector's contribution to GDP.

**Table 1.7 Annual GDP growth rates and Mining Sector GDP contribution**

<b>Year</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>
GDP % p.a.	5.4	10.6	9.6	4.4	3.4
Mining contribution to GDP (%)	7.7	8.2	9.1	8.9	10.2

**Source: Government of Zimbabwe – Ministry of Finance (2014)**

The mining sector has increased its contribution percentage relative to GDP to 10.2 in 2013 compared to 7.7% in 2009. The GDP has steadily increased with the annual growth rate in 2013 of 3.4%. This scenario makes the mining sector a key sector that has the potential to drive the economy's performance when it performs well. Accordingly the sector needs to increase its performance hence the thrust of this study to study the main factors and make recommendations on areas of improvements.

The mining sector has consistently made significant contribution to GDP and exports for the nation. The mining sector being the cornerstone of the economy should be able to perform well in order to boost the exports earnings generated and hence improve the balance of payments (BOP). PGMs have been one of the major contributors to mining exports revenues as will be discussed in the paragraphs below. Table 1.8 below depicts the average growth rates of the various selected sectors making up the Zimbabwean economy since 1988.

**Table 1.8 Average annual growth rates per sector (%)**

<b>Sector</b>	<b>1988-1998</b>	<b>1999-2008</b>	<b>2009-2011</b>	<b>2012 -2015 Projected</b>
Mining and Quarrying	2.2	-9.5	34,8	19.2
Construction	0.3	-16	2.4	2.7
Gas, Electricity and Water	-0.8	-0.4	1.5	2.7
Services	3.7	-5.0	2.0	5.9
Agriculture	3,9	-11.6	12.9	1.4
Manufacturing	1.9	-8.7	2.3	4.3

**Source: Zimbabwe Chamber of Mines (2014).**

During the period 1988 to 1998 the agriculture sector with 3.9% average annual growth rate, was the fastest growing sector hence agriculture became the main anchor of the economy's performance. Between 1999 and 2008 all sectors were in the decline with the construction and Agricultural sectors registering the highest average annual negative growth of 16% and 11.6% respectively. During the same period the mining sector declined by an annual average of 9.5%. After 2009, the stabilisation of the economy facilitated positive growth rates; the mining sector was the leading sector registering 34.8% annual average growth between 2009 and 2011.

The mining sector has therefore made significant contributions to the Zimbabwean economy post dollarisation in 2009. The expected average annual growth is 19.2% between period 2012 and 2015. This is a drop from the period 2009 to 2011 levels due to a combination of factors. The mining sector has grown at a faster rate than other sectors therefore it is critical in the economic development and growth for Zimbabwe. As a major

driver of economic growth the sector deserved to be given serious attention with the key being to explore and enhance determinants of production, export performance and beneficiation in this important sector.

#### **1.2.4 Contribution of the PGMs to the overall mining sector economic performance**

Platinum group metals (PGMs) have been at the centre of the mining sector and significantly contributed to the total mining sector's exports as summarised in table 1.9 below:

**Table 1.9 Contribution to total minerals exports per mineral group**

<b>Mineral</b>	<b>1993 – 2003 (%)</b>	<b>2004 – 2011 (%)</b>	<b>2012 (%)</b>
Gold	57.3	24.2	26.9
Chrome	20	10.7	8,6
Nickel	15.1	11.0	10.7
PGMs	2.3	46.1	27.2
Diamonds	0.8	6.7	16.1
Others	4.5	1.3	10.5
Total	100	100	100

**Source: Zimbabwe Chamber of Mines (2014)**

Table 1.9 illustrate that Platinum group metals contribute above a quarter of the mineral exports proceeds falling in the same league with gold in 2012. The sector increased its contribution to these levels from a contribution of less than 3% during period 1993 to 2003. PGMs have grown significantly to become the major contributor of total mining exports, with a contribution of 27.2% in 2012 (Zimbabwe Chamber of Mines, 2014). It is this significant contribution that makes it imperative to explore ways of ensuring that the PGMs sector improves in production, value addition and exports thereby generating more revenue and enhance the economic performance of the nation.

The PGMs exports volumes are forecast to be on the increase (Zimbabwe Chamber of Mines, 2014). The international market prices also have an impact on the revenue realised from their exports, in the medium term outlook, prices are expected to firm up according to Johnson Matthey (2014). In addition the market is experiencing a deficit as demand

exceeds supply (Polinares, 2014). Capital projects to increase the existing capacities as well as embarking on value addition and beneficiation by increasing the processes done by local PGMs miners and manufacturers will bolster the PGMs' contribution.

Zimbabwe hosts the second largest resource base of PGMs after South Africa, yet the country is contributing about 5% of the global output (Polinares, 2014). Beneficiation and increasing the value chain has potential to increase revenues, currently the mining entities are realising an average of 78% of revenues realised from the final product with 22% being lost due to the absence of smelting and refining processes locally (Zimbabwe Chamber of Mines, 2014).

In addition, the decline in export performance of the PGMs sector in 2013 and 2014 warranted further investigations to unearth the underlying phenomena underpinning the performance of this crucial export in Zimbabwe. This leads to developing strategies aimed at normalising the balance of payment side through increasing exports in the key platinum group of metals. Policy makers require greater understanding of global market dynamics and to develop the art of accurately predicting and projecting the impacts of unfavourable developments in the global market to insulate the economy from economic swings.

### **1.3 STATEMENT OF THE PROBLEM**

Zimbabwe has been experiencing persistent balance of payments deficits due to increasing imports into the country with the exports falling short to equal or surpass the imports. The mining sector was identified as one of the key sectors that can contribute significantly to the export performance of Zimbabwe. The mining sector in general and the PGMs sector in particular have the potential to contribute towards the economic performance of Zimbabwe. From the background information it has been shown that Zimbabwe is exporting semi processed PGMs products to South Africa where further beneficiation is undertaken. Even though the PGMs exports are relatively significant when compared to overall mining exports, they have not been significant enough when compared to the world production of the metals. Given the levels of PGMs reserves in Zimbabwe it is important to produce much higher output, practice more beneficiation and yield higher returns than the current levels.

#### **1.4 PURPOSE OF THE STUDY**

The purpose of this study was to determine and evaluate the factors that affect the PGMs sector's export performance and beneficiation constraints resulting in appropriate recommendations.

#### **1.5 RESEARCH OBJECTIVES**

Flowing from the purpose, the study had the following main objectives:

1. To identify and evaluate the supply side factors affecting export performance of the PGMs sector in Zimbabwe.
2. To identify and evaluate the demand side factors that affect export performance of the PGMs in Zimbabwe.
3. To establish constraints and enablers that affect beneficiation of the PGMs in Zimbabwe.
4. To make appropriate recommendations on export performance and beneficiation based on the results of the study.

#### **1.6 RESEARCH QUESTIONS**

The study proceeded on the basis of addressing the following questions:

1. What are the main supply side factors that affect PGMs export performance and what are their effects on export performance?
2. What are the demand side factors that affect the export performance for PGMs and what is the level of their impact on Zimbabwe PGMs export performance?
3. What are the constraints that affect beneficiation or value addition of PGMs for Zimbabwe's PGMs mining and processing sector?

#### **1.7 RESEARCH PROPOSITION**

Supply side factors that affect PGMs mining and export performance, encompassing operational factors, the macroeconomic environment in Zimbabwe and government interventions and policies have a significant impact to the PGMs export performance than demand side factors that are at play in the market place. Beneficiation of the PGMs in Zimbabwe is limited as a result of the binding constraints.

## **1.8 JUSTIFICATION OF THE STUDY**

The literature explored indicates that there are no studies done to evaluate the factors affecting export performance and value addition in the mining sector of Zimbabwe. The research by Gwabva (1998) focused on the export performance of the Zimbabwean manufacturing sector. This research gap necessitated this study to carry out an exploratory research in this field with the main aim being to reduce the research gap and add value.

The study contributes knowledge on factors affecting the performance of the mining sector in Zimbabwe, particularly PGMs mining, and makes recommendations on the measures that need to be taken to enhance the contribution of the sector to the growth of the GDP and improvement of the balance of payments. This research assisted in exploring the true export potential and the competitive advantages which the country can exploit to improve the country's balance of payment position. It also helped determine the sensitivity of this leading export commodity to the global market forces with a view to crafting policies and structures to insulate the mining sector from unfavourable developments as well as increase export revenues over time.

The research is beneficial to the three existing PGMs mining houses, potential new entrants into this sector, the Zimbabwe Chamber of Mines and the Government of Zimbabwe. The study brings to the fore the challenges and positives in the PGMs industry in Zimbabwe assist in resolving the challenges and harnessing on the inherent advantages to improve export performance. The research unravelled the various factors and evaluated their impact and potential impact towards export performance of the selected sector. After the study major factors are identified and their significance and impact evaluated, further quantitative researches building on this study may be carried out in order to dig deeper into the relationships between the factors and export performance and beneficiation. The recommendations from this study will add value to the mining entities, the government and the academia.

## **1.9 SCOPE OF THE RESEARCH**

The research concentrated and focused on the PGMs mining sector thereby forming a combined case study of the existing three entities. The in-depth interviews to gather data

were conducted with selected senior personnel within all three mining houses and the key informant coming from Ministry of Mines and Mining Development. The research was carried and results produced within a period of six months with the costs of the research borne by the researcher.

## **1.10 OUTLINE OF THE DISSERTATION**

This dissertation is divided into five (5) chapters with each chapter being distinctive from others yet they are coherently related. The document is structured in a manner that makes it easy for the reader to follow through the discourse, be able to gain insight into the factors and grasp the recommendations. The first section of this dissertation is the executive summary or abstract that summarises the whole dissertation bringing out the area of study, the objectives, literature engaged, methodology followed and data gathering and analysis as well as the conclusions and recommendations.

Chapter 1 introduces the topic to the reader; provide the background to the study before building up by unveiling the research problem and questions. Justifications and limitations of the research are discussed in Chapter 1. Literature review is tackled in Chapter 2, in this section the study critically review the studies carried out by prior researchers in the areas of export performance and value addition identifying the key conceptual frameworks results and recommendations. The literature review leads to the conceptual framework adopted in this study.

Chapter 3 discusses the methodology followed in carrying out this exploratory qualitative study. This Chapter discusses and justifies the instruments used to gather the data which were in depth interviews. The chapter goes on to discuss how the data was analysed using qualitative methods and the appropriate analysing software NVIVO. Chapter 4 analyses the research findings and make interpretations in line with the objectives of the study and instrument used and the qualitative nature of the data.

Chapter 5 focuses on recommendations and conclusions stemming out from the data analysis and interpretation juxtaposed with the objectives of the research the proposition made and how the findings answer the research questions. The last two chapters are

critical as they determine the value added by the study. The study will also discuss areas of further study in the last chapter. Appendices and references conclude the dissertation.

## **1.11 CHAPTER SUMMARY**

This chapter introduced the study area, which are the factors that determine the export performance and beneficiation of the platinum mining sector in Zimbabwe. The chapter went on to describe the background to the study, this section highlighted that the PGMs contribute more than a quarter of the mining export revenues and that the mining sector is a key pillar of the Zimbabwean economy. The research problem was discussed which is in short concerned with ensuring that the PGMs sector do well in terms of export performance and value addition. The research objectives flowing from the research problem are highlighted. Three research questions were formulated flowing from the three objectives. The study was justified on the basis that there is a research gap in the field of study and the study will add value to all interested parties. The demarcations of the study and the study focus entities are discussed in the scope section. To conclude the chapter the researcher runs down the outline of the dissertation which has five chapters excluding the executive summary, appendices and references. Chapter two will focus on reviewing literature on export performance and beneficiation.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

Literature review is a discussion and critique of the accounts of what would have been studied and published by researchers and scholars on a particular topic area (Bryman and Bell, 2007). This chapter will review literature on export performance and beneficiation. It is important at this juncture to point out that export performance literature diverse as it is has not yet explored the mining industry to a greater extent. Focus has been mainly on the manufacturing sector, small to medium businesses and to a lesser extent the agriculture sector. Be that as it may, it has been noted that the major focus study area from literature was the manufacturing sector which is both capital and labour intensive just like the mining sector. Accordingly the constructs identified from the literature are very relevant to the mining sector which is the sector this study focused on. The study therefore is based on the reviewed literature and discussion of how the literature is relevant to the mining sector and the PGMs sector is done as the chapter progresses.

#### **2.2 IMPORTANCE AND FUNCTIONS OF EXPORTS**

An export is a function of international trade whereby services and goods produced in one nation are shipped to another nation for future trade or sale (Duenas-Caparas, 2006; Montobbio and Rampa, 2005). The disposal of such services and goods adds to the countries' gross domestic product (GDP). In international trade, exports are exchanged for other services or products (Gilaninia, Monsef and Mosaddegh, 2013). Exports are an ancient form of economic transfer, and occur on a grand scale between countries that have fewer trade restrictions, such as subsidies or tariffs. The capability to export services and goods helps an economy to grow by exporting more overall services and goods, thereby achieving surplus balance of trade (Zhou and Zou, 2002).

#### **2.3 THE EXPORTS PERFORMANCE CONCEPT**

Export performance can be defined as the rate of success or failure of the country's drive to sell services and goods locally produced to other countries (Le Foulter, Suyker and Turner, 2001). Export performance can be evaluated as a relative measure by considering

actual exports growth relative to export market growth of the nation; this represents the potential growth in exports for a nation given that its market share will be constant. Many measures and determinants of export performance have been covered in the extant literature to be discussed in the subsequent sections. Identification of the determinants of export performance remains critical in order to improve the export performance and be able to compete globally (Akyol and Akehurst, 2003).

A review of literature by Sousa et al., (2008) revealed that there is a gap in the studies as more studies were carried out in the United States of America (USA), United Kingdom, China and other European countries. Africa, parts of Asia and South and Central America received little study from the researchers. This geographical concentration makes the generalisability of the findings from the studies to the global sphere challenging to validate.

## **2.4 MEASURES OF EXPORT PERFORMANCE**

The two main constructs in export performance literature are export performance determinants and measures of export performance. A number of export performance measures have been proposed in the literature. Sousa (2004) identifies fifty different export performance measures after analysing articles on the subject area between 1998 and 2004. Katsikeas, Leonidou and Morgan (2002) identifies forty- two measures after carrying out an analysis of over one hundred articles related to export performance. This clearly shows that there are various measures propounded in the literature thereby making comparisons between different entities or industries challenging, hence there is need for uniformity in terms of the measures of export performance.

Based on the meta-analysis by Katsikeas et al., (2002), pp. 57, seven groups of export performance measures have been identified: export intensity, export sales growth, export profit level, export market share, export sales volume, export profit contribution and other export performance measures.

Statistical analysis level is another area of concern in export performance studies. Multivariate data analysis which include structure equation models, multiple regression analyses and factor analyses and discriminant analyses have been widely used in recent

literature. This is an indication that export performance empirical literature has grown in breadth and level of sophistication (Sousa et al., 2008).

#### **2.4.1 Categorising Measures of export Performance**

One way of categorising the export performance measures is by grouping them into financial or economic and non-economic or non-financial measures this categorisation method is supported by Beleska-Spasova (2014). From the reviewed literature a number of measures are used in exports performance analysis. The most commonly used economic measures are export sales growth, export market share and export intensity (Sousa, 2004 and Cavusgil and Zou, 1994). The use of non-financial measures has grown as a result of challenges in obtaining financial data. These measures are anchored on attitudes and perception. In the non-financial category the most common measures are: perceived success of exports, exports objectives achievements, exports performance satisfaction and strength of export performance (Beleska-Spasova, 2014 and Morgan, Kaleka and Katsikeas. 2004).

Table 2.1 below depicts the various economic and non-economic measures of export performance used in the literature reviewed.

**Table 2.1 Export performance Measures from literature**

Category	Subcategory	Measures
Economic	Sales Related	<ul style="list-style-type: none"> <li>• Export intensity</li> <li>• Export intensity growth</li> <li>• Export sales efficiency</li> <li>• Export sales growth</li> <li>• Export sales return on investment</li> <li>• Export sales volume</li> </ul>
	Market related	<ul style="list-style-type: none"> <li>• Export market share</li> <li>• Export market share growth</li> <li>• Gaining foothold on the market</li> <li>• Market diversification</li> <li>• Rate of new market entry</li> </ul>
Non-Economic	General	<ul style="list-style-type: none"> <li>• Export success</li> <li>• Export performance rating from competitors</li> <li>• Meeting expectations</li> <li>• Overall export performance</li> <li>• Strategic export performance</li> </ul>
	Miscellaneous	<ul style="list-style-type: none"> <li>• Building awareness and image overseas</li> <li>• Contribution of exporting to the firm's growth and management quality</li> <li>• Customer satisfaction</li> <li>• Quality of distributor relationships</li> <li>• Product or service quality</li> <li>• Quality of customer relationships</li> </ul>

**Source: Beleska-Spasova (2014), pp. 69 – 70.**

Early studies on export performance were dominated by measures being single item which is either non-economic or economic. In order to come up with sound and reliable measures Diamantopoulos (1998) and Diamantopoulos and Kakkos (2007), posits that the indicators must be multivariate and composite, must be expressed in both relative and absolute terms, should have a frame of reference and reflect the strategic objectives of the relevant entity. There are a number of factors that influence the choice of the measure of export

performance namely: accessibility and availability of data, characteristics of the entity such as size and export experience, the level of assessment, time frame under consideration either being short term or long term, position of the evaluator within the firm and strategic objectives (Beleska-Spasova, 2014).

This study is focused on the export performance of PGM mining entities after 2009 which is relatively a short period of time. The most suitable measures for export performance in this sector are export intensity, export sales growth and export sales volumes on the economic front. Non-economic measures of export performance that are suitable are export success and meeting expectations.

#### **2.4.2 Models for measures of export performance**

Carneiro et al. (2007) carried out a critical review of export performance measures and suggests a standard analytical scheme to serve as a guiding model to evaluate and judge the operational representation and content validity of the construct. They advocate for the adoption of measures that are both dynamic and static export performance aspects. Combining the multiple measures to form a composite scale results in more reliable constructs (Carneiro et al., 2007 and Leonidou, 2002).

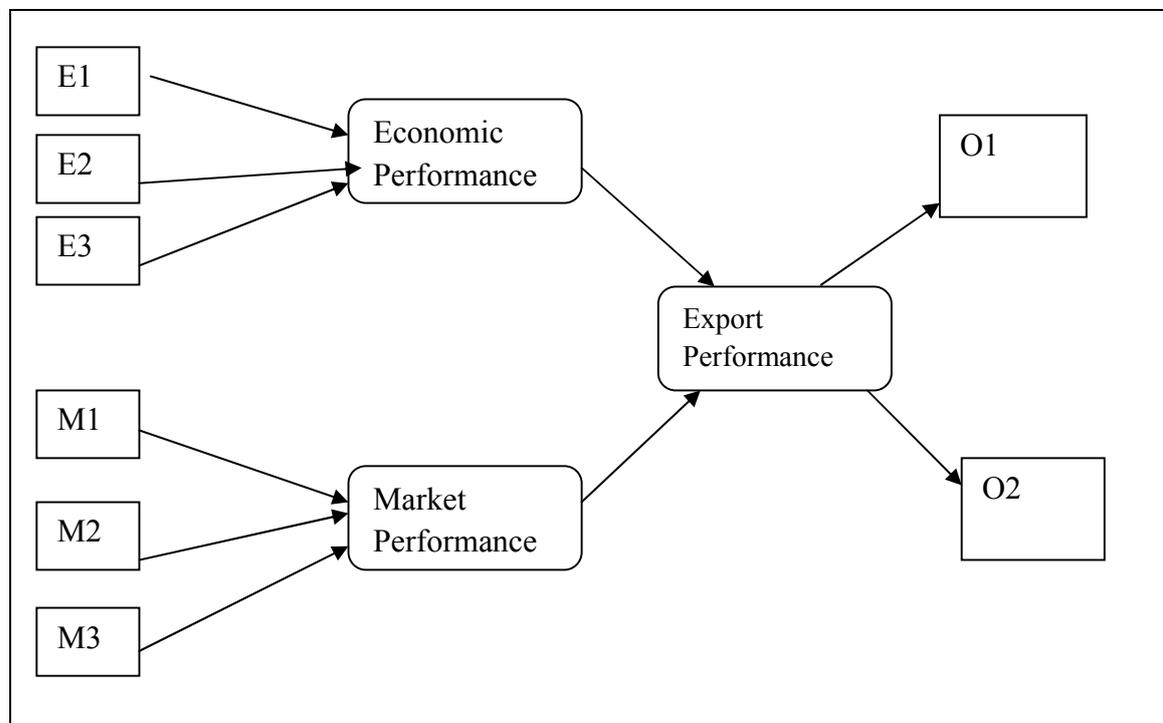
Cavusgil and Zou, (2004), Morgan et al (2004) and other researchers argue that the export venture (product or product line) is a proper unit of analysis for export performance. The justification for this school of thought is that using the export venture will facilitate a deeper understanding of the key determinants of export performance. It must be noted that there is no consensus on the proper unit of analysis; however from the literature reviewed the inclination is to use the firm as the unit of analysis rather than the export venture (Sousa et al., 2008; Cavusgil and Zou, 1994).

Another possible reason for this scenario is that respondents within firms are more inclined to reveal broad level information rather than go into specifics. According to Sousa et al. (2008) pp 365 “The chosen level of analysis depends on the study objectives. If the study objective revolves around predicting the profitability of the entity, the appropriate level of analysis is the entity, not the export venture and vice versa”. Selecting the export venture to be the unit of analysis enables the researchers to identify the influence on export

performance rather than firm wide failure or success (Cavusgil and Zou, 1994). Considering the above, in our study the unit of analysis will be the whole exporting entity as the exports are combined and there are no different lines of exports.

A new measurement model was posited which combine economic and market based performance attributes (Carneiro et al (2007)). Figure 2.1 below shows the model of export performance measures with table 4 suggesting the possible indicators of export performance based on the model.

**Figure 2.1: Export performance measurement model**



The model proffers a broad and deep coverage of the export performance phenomena. The unit of analysis used by the model is the export venture and the mode of assessment is subjective while the structure of the indicators encompasses both formative and reflective scales. The use of a combined model contributes to a better and more relevant construct representation.

The model is applicable to the PGMs area, as it incorporates both economic and non-economic measures. Financial information can be obtained from the mining entity's financial reports in order to measure the level of export performance. It is however noteworthy that the financial information may be aggregated and not too comprehensive.

To circumvent this challenge the non-economic measures become more relevant as well for the PGMs sector. Table 2.2 below has the proposed indicators applicable to the model in Figure 2.1 above.

**Table 2.2 Suggested export performance indicators**

<b>Indicators</b>		<b>Conceptual dimensions covered</b>
E1	Satisfaction with export venture in last three years	Economic, absolute, static (recent past)
E2	Revenues growth of the focal export venture contrasted to revenues of other ventures of the firm in last three years	Economic, relative, dynamic
E3	Expected export venture profitability for next three years	Economic, absolute, static (near future)
M1	Export venture volume vis-a-vis competitors in last three years	Market, relative (to competitors), static (recent past)
M2	Expected volume of focal export venture vis-à-vis volume of other export ventures of the firm for the next three years	Market, relative, static
M3	Export venture volume in last three years	Market, absolute, dynamic
O1	Overall export venture results in last three years	Overall, absolute, static
O2	Expected overall export venture results for next three years	Overall, absolute, static

**Source: Carneiro et al. (2007) pp. 12**

## **2.5 DETERMINANTS OF EXPORT PERFORMANCE**

The determinants of export performance are an important element of the export performance constructs, the identification and evaluation of the export performance determinants is part of the core of this study. Accordingly extensive review of the literature zeroed in on this specific area in order to gain deeper understanding of these factors to be able to advocate a proper conceptual framework for the study. The identification of the factors influencing production and exports will facilitates the designing and recommendations of policies to improve platinum mining sector performance and the overall Zimbabwean economy's growth trajectory.

Many studies have been carried out on export performance and a number of factors have been proposed and analysed as determinants of the phenomena. Varying and diverse constructs were advanced. Despite the investment in evaluating, examining and identifying the determinants of export performance the literature has remained atheoretical and diverse (Katsikeas, Leonidou and Morgan, 2000). Accordingly it is quite a challenge to synthesise various different studies with different thrusts into a flowing knowledge body. The lack of assimilation and synthesis of the varied knowledge is the main reason for the void in clear conclusions on export performance determinants (Zou and Stan, 1998; Leonidou and Katsikeas, 1996).

Fugazza (2004) argues that the determinants of export performance can be split into external and internal factors. External factors are related to conditions on market access and other factors affecting the demand for imports in recipient countries which include: trade barriers, transportation costs competition factors and geographical and physical situations and location of a nation in relation to the international markets. Internal factors affects the supply side conditions and these include among others location elements, access to raw materials, resource endowments, availability and costs of labour and capital and the economic environment and policy prevailing in the exporting country (Fugazza, 2004). Supply side factors also include developmental variables such as the level of public investment in infrastructure and the technologies at the disposal of exporters.

Gilaninia *et al.* (2013) propounds that variables influencing export performance are split into two namely: environment related variables and variables related to the company. Environmental factors encompass psychological distance, market information flow and market conditions adaptability; examples include business culture similarities and differences, language, procedures and industrial development levels.

Company specific variables includes: management commitment levels, distribution channels, packaging, product quality, technology levels, after sales services and research and development. The company related factors can also be divided into intangible and tangible variables. Tangible variables includes: timely delivery, the product, willingness to adapt products, quality of products, distribution channels, research and development, customer interaction and after sales service. Intangible factors are mainly classified in three categories namely skills, attitudes and knowledge (Nategh and Niakan, 2009).

Export performance determinants are also classified as controllable and uncontrollable features which are both internal and external (Nategh and Niakan, 2009). The controllable variables encompass the export marketing strategy and management perceptions and attitudes which are both part of the internal determinants. The uncontrollable features include firstly management features encompassing international experience and education level and experience; secondly company features which are looked into are company size, international experience, and technological levels and so on. The external uncontrollable features encompass industry features, the domestic market features and the export market features.

The constructs are relevant to the PGMs sector as both internal and external factors are at play in this sector. The study is therefore focused on the supply side factors, that both improve and reduce the potential for increased export performance this will touch on access to the ore reserves, availability of labour and related costs, cost of capital and availability, research and development levels, the prevailing economic environment, policies governing the sector as well as the level of infrastructure at the disposal of the mining entities. The demand side determinants are concerned with the location of the entities relative to the PGMs markets, the demand and prices in the international markets. There is no need to overemphasise the fact that some of these determinants are controllable while others are uncontrollable.

### **2.5.1 Internal factors affecting export performance**

Market related strategies are widely used as determinants of export performance. Factors which are frequently discussed are marketing mix elements which include product, promotion, price and distribution. Firm specific elements are also commonly used as export performance determinants. Firm specific elements include firm size, firm competencies and capabilities, experience as the most cited factors in empirical literature.

Cadogan et al. (2000) and Ruekert (1992), includes another key determinant of export performance being market orientation. Market oriented ventures actively gather information about the markets, distribute the information and implement measures to superiorly meet the wants and needs of their stakeholders (Cadogan et al., 2000). The hypothesis is that the more market oriented the firm is, the more export performance is

realised, a positive relationship is proposed however empirical studies have not been consistently conclusive.

Managerial characteristics form the other facet of internal determinants of export performance. According to empirical researches management is a force influencing the strategizing, formulation and implementation of success factors in export performance (Leonidou et al., 1998). From the reviewed literature the major managerial characteristics influencing export performance are: level of education, export support and commitment, international exposure of management and innovativeness. The three areas are discussed in the subsequent paragraphs below. The relevance to the PGMs sector is also discussed so as to bring enlightenment on the most relevant constructs which are at the core of this study.

#### **2.5.1.1 Export market strategy**

A number of studies have been conducted to explore the effect and importance of export marketing strategies to export performance. Attention has been mainly focussed on components of the market process namely: price, product, distribution and promotion. The results of the empirical studies have however been inconsistent and sometimes contradictory. The other variable falling in this category is marketing research. Studies have identified marketing research as a pivotal factor determining the export performance of firms (Hart and Tzokas, 1999; Ling-ye, 2004). New elements falling into this category are export planning and mobilisation of organisation specific resources towards exports (Sousa et al., 2008).

Marketing process and cooperation strategy has been rarely studied in empirical literature. In the studies conducted, however there are no consistent results on the variable's deterministic relationship to export performance (Chung, 2003; Sousa et al., 2008). The lack of research and insignificant results in this area must encourage researchers to embark on studies of these variables in the future. For the PGMs the areas of interest under the export market strategy are export planning and distribution of the products to the export market and evaluation how these affect the performance of the firms and overall sector.

#### **2.5.1.2 Firm Characteristics**

The competencies and capabilities of firms are important determinants of performance in terms of exports (Sousa et al., 2008). Possession of the key capabilities such as product quality, low cost, price competitiveness, customer relationship skills, product development

and after sales service provides organisations with comparative advantage in export markets.

The link between firm size and export performance has also been widely researched on. Some researchers have used firm size as the proxy for resource availability (Katsikeas et al, 1997; Fugazza, 2004). However the factor has not produced consistent results from empirical studies carried out to date. The inconsistencies can be attributed to differences in measures of firm size, as the terms large, medium and small vary widely from country to country. The international experience of the organisation is one of the key factors that came out from the reviewed export performance literature.

The international experience, product development and firm size will be important areas of focus for the PGMs sector. It is relevant for the study to see how these factors affect the exporting capabilities of the three entities from the data gathered from the firms as well as the Chamber of Mines.

### **2.5.1.3 Management Characteristics**

Empirical results indicate that management commitment in exports is a critical determinant of export performance. This view is supported by the reasoning that committed leaders meticulously plan and allocate adequate financial and management resources to exploit markets (Cavusgil and Zou, 1994; Christensen, da Rocha and Gertner, 1987). This results in the elimination of uncertainty and enhances effective implementation of exporting strategy.

As discussed above this category includes factors such as the level of education, experience in professions and innovativeness. Results point out those better educated managers, who have foreign language command and deep professional experience achieve more success with exports (da Rocha, Christensen and da Cunha, 1990; Dean, Menguc, and Myers, 2000; Zou and Stan, 1998). International orientation of the management makes firms explore emerging international market opportunities and manage threats. Management perceived threats and benefits of exports are also identified as being determinants of export performance (Chetty and Hamilton, 1993). The management characteristic factors are important to explore for the PGMs sector so as to be able to determine and evaluate how management commitment, educational levels and experience have a bearing on how the companies are able to enhance exports. However the study

chose to exclude these factors from the conceptual framework since the mining entities have more or less the same calibre of management teams.

## **2.5.2 External factors that affect export performance**

The external factors emanate from both the foreign market environment and domestic market environment. The external factors are therefore factors that mainly influence the market access conditions and demand for the products in the case of this study PGMs. The foreign and domestic external are discussed in turn.

### **2.5.2.1 External foreign market characteristics**

Foreign markets create both opportunities and threats for firms thereby affecting export performance. Characteristics in the foreign markets are government regulations and policies, similarity in culture, competitions in markets and the general business environment (Sousa et al. 2008). Political and legal factors and cultural similarities are the most cited determinants in this category; this conforms to the argument that political and sociocultural elements form a major dimension of external environment (Cateora, 1996). The foreign market characteristics may include exchange controls, and trade barriers (Beamish, Kavaris, Goerzen and Lane, 1999; Cavusgil and Zou, 1994; Dean et al., 2000).

The empirical studies have found that cultural similarities have a positive relationship with export performance. There has been, however lack of agreement on the appropriate measures of evaluating cultural similarities between nations (Lee, 1998; Sousa and Bradley, 2006). Sousa and Bradley (2006) provided some guidance in the area; however more research is still required for consistent measurement and conceptualisation of the construct.

Market competitiveness has also been studied as a determinant of export performance. The empirical studies reviewed however produced mixed findings. Other studies report that low market competitiveness is positively related to export performance (O’Cass and Julian, 2003). On the other hand Morgan et al. (2004) indicated that the factor is not significant, while Lages and Montgomery (2005) concluded that high market competitiveness is positively related to export performance.

The foreign markets characteristics worth studying in the PGMs sector include the requirements and legislation compelling the inclusion of auto catalysts converters on motor vehicles and the potential effect to demand. Recycling of PGMs in the countries

where the exports are channelled is also another important element to tackle as it has effects on the demand and pricing of the products from the Zimbabwean PGMs exporters.

#### **2.5.2.2 External domestic market characteristics**

Two determinants were identified from the researches carried out namely environmental hostility of the local market and export assistance. The findings tend to suggest that firms perform better in stable environments than in volatile environments (Robertson and Chetty, 2000, Sousa et al. 2008). Researches carried out also conclude that government and non-governmental organisations' programmes in support of exporting activities have positive contribution to export performance (Alvarez, 2002; Lages and Montgomery, 2005).

According to Fugazza (2004) internal transport infrastructure as indicated by the percentage of paved roads was tested and found to have a positive and significant impact on export performance. The area of domestic external factors has not been extensively researched on from the existing empirical studies. Accordingly this study will zero in on this category in order to reduce the research gap and get to know the external domestic factors within the Zimbabwe mining sector in general and the PGM sector in particular. The stability level of the Zimbabwean economy and the consistence of policies and their effects on the capability to realise more from the PGMs exports are other areas that are relevant.

### **2.6 PGMS BENEFICIATION LITERATURE**

According to MISTRA (2013), mineral beneficiation is value addition of mineral from exploration, extraction, concentration to refining and production of the final product for consumption. PGMs Beneficiation involves four stages with the product gaining more value from one stage to another (Mudd, 2010). Firstly the process involves extraction and converting mineral ores to a significantly concentrated product, the second stage involves metal alloys production; this can be referred to as the first stage of the manufacturing process. The third stage involves enhancements to allow meeting end user requirements. Lastly involves consumption and selling stage, whereby the final product is produced ready for the market. Appendix 2 depicts the beneficiation processes for the PGMs:

Natural resources are different from other wealth types as they are not produced, they are endowments. They do not earn a rate of return, like produced wealth, natural resources generate rents also known as economic profits. The themes that are discussed under the beneficiation section are firstly the forms that beneficiation takes namely downstream and side stream. Secondly the discussion focuses on constraints on beneficiation which encompass access to raw materials, levels of infrastructure, research and development levels skills levels and international market access. The beneficiation benefits to the PGMs sector are finally discussed.

### **2.6.1 Forms of mineral beneficiation**

Mineral beneficiation takes two forms. The first form is downstream and the second is side-stream (MISTRA, 2013). Both forms are critical for social development, job creation and economic development and growth. Downstream beneficiation is the primary beneficiation where ore is mined, value added until the final product is achieved and distributed. Side-stream beneficiation is an extended type of beneficiation. This involves construction of roads, infrastructures, railways, airports, harbours and institutions. The reasons behind side-stream beneficiation is to be able to process the ore and selling them to different destinations (Bexter, 2012), Zimbabwe must implement strategies to assist the country to maintain development and economic growth leading to more returns and opportunities for the country.

The booming of China's economy has one of the reasons rooted on mineral beneficiation (IMF, 1997). One of the factors leading to the economic growth for China is its mineral resources policy (IMF, 1997). As opposed to Africa, China's government controlled a number of its industries hence it become easier for the country to work coherently towards the ideological objective on mineral beneficiation resulting in the country's growth trajectory.

China is one of the nations which beneficiate until the final stage when the product is ready for the market (Mudd, 2010). The same applies to nations such as Turkey, India and Italy. Given the requirement for infrastructures (railways, roads, factories, buildings and ports development for African and Zimbabwe, economic development and infrastructure growth must be of high importance to decision makers and strategic thinking tanks in Africa.

## **2.6. 2 Mineral beneficiation constraints**

From the reviewed literature there are a number of binding constraints on mineral beneficiation. This section will discuss five of these constraints which are: limited raw materials access for domestic beneficiation, infrastructure shortcomings, limited research and development, inadequate skills and international markets access (UNECA, 2011). Southern Africa and Zimbabwe in particular has limitations on electricity generation capacity which is insufficient to meet the requirements resulting major brownouts and blackout risks.

Policy makers are confronted with challenges constraining the creation of capabilities downstream PGMs beneficiation. These challenges include the required improvements in transport and electricity infrastructure in the nation (Wilburn and Bleiwas, 2004). Electricity and water supplies are highly pertinent given that PGMs beneficiation involve energy intensive processes as well as the use of water.

Mineral value addition needs skilled and well equipped labour force (engineers, technicians, designers, metallurgist, entrepreneurs, geologists and so on) (MISTRA, 2013). Shortages of engineers and specified skilled artisans also affect the potential for beneficiation. Effective beneficiation requires skilled and highly trained electrical and chemical engineers who are in short supply in Southern Africa (Soko and Bulchin, 2012).

In addition Zimbabwe faces market access constraint arising from the geographical distance between the country and major PGMs products markets, and the existence of limited regional markets for the PGMs products. Other factor that have effects on the level of beneficiation include labour costs that are uncompetitive, inability to access inputs and raw materials for value addition at competitive prices, regulatory red tape , high cost of capital and the existence of barriers to trade for beneficiated products in key markets (Hawkins, 2009).

Export performance prospects for the platinum industry are hinged on macroeconomic stability and global demand upturn (Hawkins, 2009). It is noted that even with positive policy preconditions and favourable market condition; performance will be constrained by a number of supply side bottlenecks. According to Hawkins (2009) the six main constraints are: policy unpredictability and uncertainty; skills supply, infrastructure

development (electricity, transport and water), and the fiscal regime, policies on macroeconomics, foreign ownership restrictions and indigenization.

Enabling networks, institutions and personnel development are at the centre of mineral beneficiation. The key concern is that does Zimbabwe have the required capacity. Africa is a continent rich in resources; however, yields from the endowments have not been able to produce significant growth and development for the continent. (Soko and Balchin, 2012). Beneficiation is a component of developmental plans for Africa and Zimbabwe as well.

#### **2.6. 4 PGMs beneficiation levels in Zimbabwe**

Undertaking higher levels of downstream value addition foster backward and horizontal linkages in the industry (MISTRA, 2013). Beneficiation thus assists in employment creation, technological innovation and skills development thereby increasingly economic growth. Despite significant PGMs resources endowment in Zimbabwe the level of beneficiation undertaken has remained low with Zimplats being the only producer that smelts the product with the other two ending at the concentration stage.

The three major markets for value added PGMs are the auto-catalyst, industrial chemicals and jewellery. The auto-catalyst and jewellery industry represents the largest markets for value added platinum, palladium and rhodium resources. (Johnson Matthey, 2013). No significant downstream beneficiation is taking place within Zimbabwe in these two industries, which are firmly established beyond Zimbabwe's borders. In contrast South Africa is already producing thirteen (13) percent of the global catalyst converters (Soko and Bulchin, 2012).

#### **2.7 BENEFITS OF LITERATURE EXPLORED**

According to Sousa (2004) and Katsikeas et al. (2000) export performance is important to researchers, managers and policy makers. Governments prioritise exports as a means to attract foreign currency, increasing productivity, improving the employment levels and ultimately the general standard of living. Managers consider exports important as they boost company performance, growth and long term survival (Samiee and Walters, 1990; Terpstra and Sarathy, 2000). Researchers are ultimately challenged to explore the

interesting study area in order to build theory on export performance and expand knowledge.

The study by Fugazza (2004) has a number of policy implications that can be learned and applied in developing economies like Zimbabwe for the benefit of the industries and the economy as a whole. Some of the policy implications recommended are to promote public investment and private public partnerships in order to improve infrastructural development. A stable macroeconomic environment is also important as it enhances predictability and hence exports performance. Inter-sectorial linkages and diversification and beneficiation should be promoted and reducing trade barriers is encouraged as it leads to improved access to markets and higher returns from exports. The empirical researches also recommend increasing industrial exports to replace commodities exports which are susceptible to international price swings (Majeed and Ahmed, 2006).

PGMs beneficiation literature is important for the Zimbabwe mining houses and the policy makers. They need to consider the constraints hindering the full beneficiation of the precious metals. Focusing on the constraints and finding ways to reduce or eliminate them will enhance the business environment thereby providing opportunities for the country to realise more from the PGMs resources. The literature provides the constraints themes which will be evaluated by study through data analysis and interpretation.

## **2.8 LITERATURE CHALLENGES AND GAPS**

The export performance empirical literature reviewed in this study was mainly concentrated in the manufacturing sector; no study reviewed covered the mining sector. The presence of this gap in the literature will be reduced through carrying out this exploratory research which will enable readers to identify and evaluate the factors that influence the performance of the PGMs sector in Zimbabwe and recommending the necessary measures for improvement. The literature on PGMs beneficiation is not very wide, with limited availability of refereed journals in the area. The literature on beneficiation mainly comes from parties that are actively involved in the PGMs mining and value addition processes, however despite being thin the literature is informative enough to form a useful foundation for the study.

## **2.9 CONCEPTUAL FRAMEWORKS FOR THE STUDY**

This study is a qualitative exploration one which seeks to identify and evaluate the factors that play a role in enhancing or inhibiting export performance in the PGMs industry in Zimbabwe as well as the constraints to beneficiation. On export performance this study will focus on the supply side and demand side factors, given the peculiarity of the sector from which the information will be gathered.

### **2.9.1 Supply Side factors**

The supply side factors will affect the ability for the exporting firms to be able to produce and dispose the product to the international market. The thematic areas in this section will be as tabulated in Table 2.3 below:

**Table 2.3: Supply side factors affecting PGMs export performance**

<b>Internal factors</b>	<b>External factors</b>
<p><b>Operational factors</b></p> <p>Human resources</p> <p>Availability of Finance</p> <p>Raw materials (Sources and costs)</p> <p>Technology levels within production</p> <p>Final product (level of processing)</p> <p>Distribution channel and costs</p>	<p><b>Industry factors</b></p> <p>Industry stability</p> <p>Predictability of changes</p> <p>Risk levels</p> <p>Competition</p>
<p><b>Firm Characteristics</b></p> <p>Company size</p> <p>International competencies</p> <p>Foreign ownership</p> <p>Firm Age / experience</p>	<p><b>Macroeconomic Environment</b></p> <p>Interest rates</p> <p>Exchange controls</p> <p>Access to capital finance</p> <p>Electricity energy and water</p>
	<p><b>Government policies and regulations</b></p> <p>Taxes (corporate tax, royalties, valued added tax)</p> <p>Mining incentives</p> <p>Environmental and other regulations</p> <p>Mining regulations</p>

### **2.9.2 Demand Side factors**

Demand side factors are equally important in export performance as they determine whether the PGM products are sold and at what price? Under this thematic area the factors that will be evaluated are: access to the export markets, barriers and ease of entry in the market, the level of competitiveness, pricing structures and global economic environment.

### **2.9.3 Beneficiation constraints conceptual framework**

The study will be grounded on the five constraints namely: limited raw materials access for domestic beneficiation, infrastructure shortcomings, limited research and development, inadequate skills and international markets access. The study will be aimed at identifying the major constraints in the Zimbabwean PGMs sector and make appropriate recommendations that will go a long way in enhancing value addition and high returns in the long term.

### **2.10 CHAPTER SUMMARY**

This chapter begins by the introduction part discussing the importance of literature review and setting the tone for the areas covered in the literature of this particular study. Discussion of the concepts of exporting and export performance follows. The constructs of the export performance theory are then discussed. Firstly to be explored was the export performance measures where it was highlighted the measure are categorised as economic and non-economic, subjective and objective. The measures may be expressed in both absolute and relative terms with dynamic and static time frames. Secondly the determinants of export performance whose major categories are the internal and external determinants were discussed. The factors were also split into controllable and uncontrollable segments. Literature on mineral beneficiation was reviewed with the major outcome being the identification of five major constraints that are at play namely: limited raw materials access for domestic beneficiation, infrastructure shortcomings, limited research and development, inadequate skills and international markets access. The chapter is concluded by running through the benefits from the literature followed by the gaps identified which this study sought to reduce before providing the study's conceptual frameworks.

## **CHAPTER 3: RESEARCH METHODOLOGY**

### **3.1 INTRODUCTION**

This chapter describes the methodology used in the study, including the approach method and data collection. The discussion reveals the appropriateness of the methods and instruments used, as well as highlighting some limitations and how they were overcome or reduced. Other areas covered in this chapter include the data sources utilised, data limitations and research ethics and data credibility.

### **3.2 RESEARCH DESIGN**

Research designs prescribe how the study is undertaken in order to address the research questions thereby fulfilling the objectives of the study under the prevailing time and budget constraints. Research design involves philosophical underpinnings and distinctive procedures and strategies implemented in carrying out the research (Creswell, 2003). Slife and Williams (1995) espouse that philosophical ideas and ensuing strategies need to be known in advance as they influence the research practice.

The research design is therefore an outline or pattern of the research project that provide a framework applied to guide the collection, presentation and analysis of data (Creswell, 2003). This research design section will discuss the research approaches that may be used namely the quantitative and qualitative approaches. The study selected the qualitative approach which is justified accordingly. The strategies that may be used in qualitative studies are highlighted with the study adopting the case study strategy.

#### **3.2.1 Research approach**

There are basically two approaches to research namely: the quantitative and qualitative approaches. The quantitative approach embraces the positivist paradigm and is based on the belief that knowledge is valid if developed by testing hypotheses that are developed from theory. Quantitative research methods are anchored on the use of numbers in analysis of the results and normally study cause and effect relationships (Saunders, Lewis and Thornhill, 2011).

The advantages of the quantitative approach are that there is greater opportunity for the researcher to have control of the research process, reliability and replication of findings is high, quantitative approach has greater theoretical focus and provides economical means of collecting huge amounts of data (Saunders et al, 2011). The major disadvantage is that the approach is weak in understanding the social process and the meaning attached by human beings to various phenomena.

The qualitative approach is grounded on social sciences. The paradigm is based on the notion that that reality is contextual and relative not absolute. Knowledge is gained through the interpretation of experience, views and feelings of the respondents (Creswell, 2003). The qualitative approach's effectiveness is in its ability to study information about opinions, values, social contexts and behaviours of chosen populations.

The strength of the qualitative approach lies in its capability to offer complex textual analysis and descriptions of people's experience on the chosen study matter. The disadvantages of the qualitative approach is that reliability of the findings is not high, and the analysis of data is challenging and more involving when compared to the quantitative approach, finally the qualitative approach is more subjective rather than objective (Creswell, 2003).

This study followed the qualitative approach since the area of PGMs mining export performance and value addition in Zimbabwe has not been adequately explored. The study sought to build knowledge on the key factors driving and inhibiting the two phenomena in the PGMs sector in Zimbabwe. The qualitative method is appropriate for this study as respondents were afforded the opportunity to provide detailed narrative data useful in addressing the research objectives.

### **3.2.2 Research strategy**

Research strategies are also known as also known as approaches to inquiry (Creswell, 2003). There are various strategies that may be used in exploratory, explanatory and descriptive studies (Yin, 2003). Some of the strategies are inclined to the inductive or deductive approaches. The selection of the research strategy was guided by the research objectives, the research questions, the time of the study and resources available and the

level of knowledge existing in the study (Saunders et al., 2011). The major strategies that may be utilised in research are: experiments, surveys, case studies, action research, grounded theory, ethnography, participative enquiry and archival research. This study embraced the case study strategy.

The case study method embraces carrying out an in depth study of chosen situation, differing from purely statistical survey. Proponents of case study argue that it digs deeper into situation than pure statistical surveys. Case studies are flexible methods of research as they have the potential to introduce new theory hence charting new directions in research (Yin, 2003). The leading argument against case studies comes from their narrow scope. As a result of the narrow scope, case studies results in difficulties in extrapolating findings and conclusions to the entire population. Other researchers dismiss the case study method as only useful as an explanatory tool (Creswell, 2003).

Case studies may take two forms namely being a single case or a multiples case study. A case of a specific entity or situation at a particular time is a single case. A collective case or multiple cases focuses on more than one entity or situation. The study is a collective case of three cases being from the three mining entities which became the units of analysis.

There are a number of steps in carrying out case study research. This study started by determining the research objectives, which are firstly to identify and evaluate the supply side factors that affect export performance, secondly to identify demand side factors affecting export performance. Lastly the study sought to establish constraints affecting PGMs beneficiation in Zimbabwe.

The next step involved selecting the three cases as units of analysis. After selecting the cases the next step was on deciding on the most appropriate data collection tool. The tool used in gathering the data was conducting in-depth interviews using the interview guides. The tool focused on the research questions and objectives. The study proceeded through self-administrated in-depth interviews with nine executives from the three entities and one key informant knowledgeable about the industry. The interviews were conducted on face to face basis and were one on one rather than group discussions. The in-depth interviews were most appropriate as they ensured that more information was collected and enabled the interviewer to ask probing questions and gain deeper understanding of the factors sought.

Data evaluation and analysis was the next step. The analysis software NVIVO was extensively used to analyse data. The data gathered was presented, analysed and discussed in chapter four. The data analysis findings and discussions led to the conclusions and recommendations to wrap up the study.

### **3.3 POPULATION AND SAMPLING**

#### **3.3.1 Population**

A population is made up of all elements that fall within the ambit of the study, which is a universal group (Frankel and Wallen, 1996). The population for this study comprised of senior management from the three mining entities. Senior executives were targeted as they have the knowledge, experience and ability to articulate on the factors that the study sought to determine and evaluate. The senior executives from the three entities were twenty eight, nine from Mimosa; eleven from Zimplats and eight from Unki Mines. Key informant on policy and industry wide concerns was selected from the Ministry of Mines and Mining Development. The permanent secretary from the ministry provided the information from the perspective of the Ministry of Mines and Mining Development.

The Ministry of Mines and Mining Development administers the Mines and Minerals ACT (21:05) with its main functions being to formulate policies on mining, implementation, evaluation and monitoring mining development policies. The ministry is also responsible for accounting for Zimbabwe's mineral resources and administering and reviewing mining and exploration laws among some of its mandates.

#### **3.3.2 Sample selection**

Sampling involves selecting a finite set of the population which will be studied to acquire knowledge about the whole population (Wegner, 2003). Saunders et al. (2011), identified two major sampling techniques namely probability and non- probability sampling. Probability sampling category has four major types namely: simple random, systematic, stratifies and cluster sampling. The study utilised the non-probability sampling method given that the population frame comprised of less than thirty individuals. The non-probability sampling methods includes: quota sampling, convenience sampling, judgement sampling, purposive sampling and snowballing.

**Convenience sampling** involves selecting the most close or preferable elements as proxies of the population. Wegner (2003) states that convenience samples are a representative sample selected to suit the researcher's convenience. This sampling technique has researcher bias respondents bias. **Quota sampling** involves deciding how many elements with what characteristics to include in a study as participants. Saunders et al. (2011) described quota sampling as a stratified sample type with non-random selection of participants from the strata.

**Judgemental sampling** involves the researcher choosing a sample from the population using own judgement. This technique is more subjective and researcher biased (Robson, 2002). **Snowballing** is used to identify potential participants where a study involves difficulties in locating potential subjects. This technique uses the initial subjects to assists the researchers to select other subjects with similar characteristics. **Purposive sampling** is a common strategy of sampling. The method group participants based on preselected criteria applicable to particular research questions.

This specific study used the purposive sampling technique whereby three knowledgeable participants from senior management were chosen from each of the three PGMs mining entities. In-depth interviews were carried out on the company participants and in addition the Ministry representative was selected using purposive sampling method. Nine knowledgeable senior managers were selected, three from each entity. The selected managers encompassed Chief Executive Officers (CEO), Chief Financial officers (CFO), General Managers, Plant managers, mining mangers and other knowledgeable senior managers.

### **3.4 DATA COLLECTION TECHNIQUES**

The data was collected using ten (10) in depth interviews. In depth interviews were self-administered so as to collect more detailed data. Interviews facilitates the gathering of in-depth information from the participants mainly pertaining to their experience and views on the study topic (Turner, 2010). The formats for interview were summarised by Gall, Gall and Borg (2003) as; standardised open ended interview, informal conversational interview and general objective guide format. This study utilised the interview guide format to

conduct the in-depth interviews thereby enabling the study to gather detailed data and provide the ability for probing.

### **3.5 SOURCES OF DATA**

Data can be collected from primary and secondary sources. Primary sources involve collecting data for the particular research problem under study. The primary data are gathered using the most appropriate procedures. The advantage of primary data collection is that the theoretical constructs operationalisation, research design and data collection instruments are in tandem with the research question and objectives hence study enhancing coherence and rigour (Hox and Boeije, 2005).

Notwithstanding the advantages primary data gathering is time consuming and costly. Secondary data are data collected by other researchers earlier for different purposes than the current study (Hox and Boeije, 2005). Secondary data may involve administrative records, official statistics and narrative records routinely kept by organisations. This study used primary data gathered through the guided interview research instrument.

### **3.6 DATA ANALYSIS**

Qualitative data comprise of observations and words not numbers. To be useful data require analysis and interpretation of meanings (Sounders et al., 2011). Qualitative data analysis is an involving endeavour which must be properly undertaken. The analysis package NVIVO was utilised to analyse the qualitative data. The processes that were followed in the data analysis stage are discussed below. The study began the analysis of the data during the data gathering process and continued until the conclusions and recommendations were reached.

The first stage of the analysis involved preparing the data for analysis and the two processes used were transcribing the data and data cleaning. The interviews were audio recorded and transcribed into written narratives. The data cleaning process involved checking and correcting transcriptions errors. The transcribed interviews were stored as separate distinct word files.

The data analysis process utilised for this study involved: summarising meanings, categorisation of meanings and making the relevant interpretations and conclusions. Summarising involved condensing the meaning of data in the form of detailed texts from transcriptions into fewer words. (Kvale, 1996). This process produced a summary of key themes and concepts that were derived from the guided interviews.

Categorising data involves the creation of categories and then allocating meaningful pieces of data to each category. Categories are in effect labels and codes used for grouping the data from the study. The categories identification also hinged on the study purposes and the research questions and objectives. After developing categories the next step was attaching chunks of data (units) to the relevant categories. This stage was also guided by the purpose of the study and enabled the classification of data into comprehensible and meaningful form. The next step involved recognising patterns and connection between and within categories. The key ideas within each category were identified with similarities and differences of responses being analysed. A summary of each category was therefore written up. As already indicated NVIVO was utilised to speed up the data analysis and interpretations.

### **3.7 RESEARCH LIMITATIONS**

The study was carried over a period of six months, this created limitations on the rigour with which the study was subjected to. To enable a reliable study to be achieved the study ensured all three mining entities were used as units of analysis,

### **3.8 RESEARCH ETHICS AND DATA CREDIBILITY**

#### **3.8.1 Research ethics**

A number of ethical considerations were addressed before, during and after the study was conducted. The critical issues that were addressed in this study as espoused by Miles and Huberman (1994) are: informed consent, harm and risk, honesty and trust, and privacy, confidentiality and anonymity.

The selected participants were informed of the nature, scope, objectives and purpose, data collection methods and the estimated time the interviews and questionnaires were to take

in advance before the actual data gathering process commenced. There was emphasis to the fact that the research was an academic endeavour and that the data gathered were not to be used for any other purposes except for this study. Permission was sought to use audio recording devices during interviews.

Participants were assured that the study was to be carried out in a manner that did not create any harm or potential for harm to participants and the organisations they represented. There was no fabrication of data as correct and complete data collection was adhered to. The data were securely stored, data processing was accurately executed and the participants were advised that they had a right to request study results. Data confidentiality was prioritised during the collection, analysis and reporting stages. The study was conducted in a manner that ensured confidentiality through ensuring that the findings and data analyses did not mention the names of the participants or any characteristics that could identify them. All participants voluntarily took part in the study. The data were analysed in an honest and objective manner and the results were not misrepresented in any way.

### **3.8.2 Data credibility**

Data credibility is concerned with the truthfulness of the data and the instrument (Saunders et al. 2011). In qualitative research credibility can be described as the level with which the data gathering and data analyses are trustworthy and believable. Credibility encompasses two aspects of validity and reliability.

The possibility of multiple realities in qualitative research affects validity (Miles and Huberman, 1994). The utilisation of member checking and accessing feedback on the data analysis and interpretations from the project supervisor and participants increased credibility. There was provision of deep description of the setting and the study methodology thereby providing the reader with adequate information to base judgements on the credibility of the study findings and recommendations. In addition the fact that participants were selected from all three PGM mining entities assist in improving external validity as the sample became more representative.

### **3.9 CHAPTER SUMMARY**

The study was hinged on the qualitative approach given that this was an exploratory study. Case studies of the three PGMs mining companies were carried out using the guided interview research instrument. The participants were selected from all three units of analyses in order to ensure that the sample is representative. The primary data from the interviews were used for the data analysis carried out utilising NVIVO. Ethical issues were adhered to in order to enhance the acceptability of the research and not to put the researcher, the University of Zimbabwe, the participants and their organisation into disrepute. Measures were taken to enhance the credibility of the data throughout the research process. The next chapter concentrate on the analysis and interpretation of the findings from the fieldwork.

## **CHAPTER FOUR**

### **ANALYSIS, INTERPRETATION AND DISCUSSION OF FINDINGS**

#### **4.1 INTRODUCTION**

This chapter presents the findings from the study, analysing, interpreting and discussing them. The study is purely qualitative with the interview guides used as the data gathering instrument. Content analysis and narratives are the major findings presentation modes used. The findings to be discussed are the factors affecting export performance from both the supply side and demand sides. Beneficiation constraints are presented analysed and discussed as well reference is made to the literature reviewed and how it relates to the Zimbabwe's PGMs mining sector.

#### **4.2 STUDY PARTICIPANTS**

A total of ten in depth interviews were conducted with three of the interviews conducted from each of the three mining entities making the total of nine interviews. The tenth interview utilised the Ministry of Mines key informant from the office of the Permanent Secretary. The three mining entity cases are referred to as Case 1, Case 2 and Case 3 not in any specific order. The brief profiles of the specific companies making up the case studies are discussed below.

Zimplats is the largest of the PGMs mining entities in terms of production capacity and it also is ahead in terms of level of processing as it processes the PGMs up to the smelting stage. The company exports all its PGMs matte to South Africa for further processing through the Base Metal Refinery (BMR) and the Precious Metal Refinery (PMR). The company currently operates four mines, two concentrators and one smelter. The company is based in Ngezi and Selous.

Mimosa is the oldest one of the PGMs operating mines in Zimbabwe. It is however, the second largest in terms of volumes and capacity and processes until the concentrator stage. The concentrate is exported to South Africa for further processing through smelting and refinery processes. Mimosa is located in Zvishavane and is jointly owned by Implats and Aquarius on a fifty: fifty arrangements.

Unki is the smallest of the three mines based on production and the capacity of the level of operations. Unki started exporting its concentrates to South Africa in 2011. It is based in Shurugwi and currently operates one decline shaft mine and a concentrator plant. Table 4.1 below shows the characteristics of the selected participants:

**Table 4.1 Selected Interview participants**

Case	Participants	Gender distribution	Average experience
Case 1	3	2 Male, 1 Female	12 years
Case 2	3	2 Male, 1 Female	9 years
Case 3	3	2 Male, 1 Female	10 years
M.O.M	1	Male	7 years
<b>Total</b>	<b>10</b>	<b>7 Male, 3 Female</b>	

From Table 4.1 it follows that seven out of the ten selected participants were males, while 30% were females. This is as a result of the fact that mining is a male dominated sector and this is also reflected at the top executive levels. The averages work experience of the participants is above seven years thereby indicating that the participants are experienced and well versed to provide reliable well balanced responses to the question posed in an effort to address the research objectives.

#### **4.3 ANALYSIS, INTERPRETATION AND DISCUSSION OF FINDINGS**

This section of the study focuses on the presentation, analysis, interpretation and discussion of the findings. The findings are discussed under the various themes falling within the factors addressed by the participants in order to address the three research questions. Our discussion of findings will first address the supply side factors affecting PGMs export performance, followed by the demand side factors influencing PGMs export performance. The third section will discuss the PGMs beneficiation constraints and enablers. A summary of the NVIVO analysis report is incorporated in appendix 7.

### **4.3.1 Supply side factors affecting export performance**

There are various factors that have affects export performance from the supply side. These factors have a bearing on the volumes produced, the quality of the products as well as the level of processing involved. The discussion on the supply side factors touches on the operational factors, the firm specific characteristics, the industry factors, the macroeconomic environment and the government policies and regulations influencing the PGMs sector export performance.

#### **4.3.1.1 Operational factors influencing export performance**

The operational factors are the factors that have greater impact on export performance based on the findings of the study. The specific elements to be analysed, interpreted and discussed are the human resources, finance, raw materials, the technology levels, level of processing and the distribution channels for the exports. The discussion will zero in on the level and significant of the effect on export performance analysing the findings and verbatim comments from all the participants.

#### **Human Resources**

The participants concurred that the nation has a huge labour force supply which is enough to be absorbed by the PGMs mines. Case 1 interviewee 3 argues that “generally the labour market has excess supply that is able to cater for the PGMs sector hence generally mining labour force is not a challenge’. The same sentiments were echoed by the Ministry of Mines representatives who posited that the country has an abundant labour force hence the acquisition and deployment of human resources does not negatively affect export performance, This is in line with Fugazza (2004) who concluded that availability of human resources positively influence export performance. Case 1 interviewee 1 pointed out that attracting the labour force was not a major problem as the PGMs mines grew at a time when the major mining giants, Shabanie, Zisco and Mimososa were sliding down, accordingly the market saw the labour force shifting from the previous mines to platinum.

The second participant from Case 2 pointed out that, Human Resources there are no major constraint, and “the human resources is available in the market which is not vulnerable to strikes”. However, training is crucial for the mining teams, the expertise of technicians,

artisans is also crucial, the market has excess demand than supply as most of the technical colleges and apprenticeships have gone down.

Further probing on the skills levels and the ease of training the labour force, however revealed that the human resources element is not just about numbers but about retaining the appropriate skills and relevantly training the personnel. The interviewees all concurred that the market currently has limited numbers of artisans and engineers who are the most appropriate labour force to drive PGMs export performance. Case 2 interviewee 1 pointed out that there is a serious problem of artisan's shortages indicating that a number of training institutions controlled by government and organisations such as NRZ and ZESA which used to be the training ground for the required skills are no longer capacitated to handle the demand. The interviewee commented that in the medium term if measures are not taken to bridge the gap the sector may face skills shortages as the current crop of artisans will be retiring. The same sentiments were echoed by Case 1 Interviewee 2 who went on to advise that it takes a period of three to six months to set up mining teams and that the members will have to be trained on all aspects of the processes. Sousa et al. argues that higher training and retention costs have positive impact on export performance and these sentiments were supported by eight of the participants who touched on this factor.

From the results on the human resources element it is apparent that the labour force in the PGMs sector is not fully equipped and trained and there are gaps in terms of skills for the hands on people who are productive. The human resources element in this respect has a negative influence on the export performance of the sector. It was noted from the interviews that each mining team requires a team leader who must possess a Mining Blasting License (MBL), training for the team leaders make take six to eighteen months. The training gap has resulted in negative impact on export performance indicating that the more the PGMs mines invest on appropriate training and relevant skills development the result will be positive on future export performance.

These findings indicate that the human resources element being not adequately trained has negative influences on the PGMs export performance. Training institutions must be revived in order to boost production and ultimately export performance as echoed by Case 1 Interviewee 2 who stated that "mining needs hands on people who are productive rather than graduates. The human resources factor is therefore two pronged on the other hand the

labour is available, however relevant skills and training are required if the production and exports are to significantly improve.

### **Raw Materials**

The point that the PGMs reserves available have the potential to last into the long term future was pointed out by all participants. The raw material factor in terms of the PGMs ore is unidentified as having a positive impact on export performance as the firms can double or treble their mining output provided the adequate labour and machinery is available without a challenge. The argument of having abundant PGMs reserves is supported by Fugazza (2004), who concluded that the proximity and availability of raw materials positively affects export performance. The grades of the Zimbabwean resources on the Great Dyke are lower than the South African resources, with prices going down this may render some resources to be unprofitable there by cutting back on them. Interviewee 3 from Case 3, however highlighted that the Zimbabwean mines are not as deep as the Merensky reef mines hence the costs to extract the ores are relatively cheaper in Zimbabwe.

The concentrators and refineries also require raw materials in the form of reagents and catalysts to speed up the processes. These consumables were noted to be imported mainly from South Africa, the imports therefore increases the costs of production thereby eroding profitability and export performance. Case 1 Interviewee 1 argued that “most of the plant consumables are imported, we need to create the capacity of the local industry as importing through middlemen is also increasing costs.

In terms of raw materials supply the findings point out that the PGMs resource is not a challenge as the available reserves facilitates export performance in a positive way. The raw materials for the plants are wholly imported, thereby involving transport cost which erodes the returns and negatively affects export performance for the PGMs sector in Zimbabwe. Increasing ore throughput from the mining activities will have a positive impact on the PGMs export performance, however this will require more capital injections to cover the expansion projects.

## **Finance availability**

The findings revealed that mining is capital intensive hence the costs and availability of finance to cover mining development and plant capacity increases is a crucial factor. The participants' overwhelmingly agreed that the cost of finance in the Zimbabwean market is too high. The cost factor therefore has a negative effect on the level of export performance. The Zimbabwean financial services sector faces liquidity challenges resulting in unavailability of finance to fund the much need expansion projects that results in more output. Case 2 interviewee 1 contends that "lack of finance in the local market has negatively affected team development and throughput expansions".

There is a general limitation on borrowing locally given the fact that the financial sector is not liquid and the interest rates are very high thereby washing away profitability from the ventures. As a result all respondents indicated that funding for projects comes from the parent companies that have to cater for the whole group's requirements. This scenario limits the financial support available because the group will prioritise low risk projects. Sousa et al. argues that the limitation on financial resources creates a bottleneck for expansions and growth. This is the scenario for the PGMs sector as the entities have to rationalise and discontinue less profitable ventures thereby slowing down output growth and exports.

## **Technology**

Technical expertise and investment in technology is crucial in the PGMs sector. All three mines are highly mechanised thereby speeding the ore extraction and minimising the potential for mining accidents affecting human capital. The plants are also highly automated with limited human interaction. The technological levels enhance productivity thereby becoming a positive influence on export performance.

All of the participants concurred that the grade of the PGMs locally is low when compared to South Africa. They argued that new technology must be acquired in order to improve the processing efficiencies of the plants. Case 1, Interviewee 2 indicated that "technology is crucial to improve the grades and output, however power and infrastructure issues must also be addressed for the new technology to be effective". Literature supports the notion

that investments in technology provide the capacity to increase efficiencies, quality and output (Gilaninia, 2013; Fugazza, 2004).

The study has thus established that the automation and mechanisation in the PGMs sector has positively affected the production and export performance of the existing firms. More investments in technology especially to improve efficiencies and product grade have the potential to positively influence the performance of the PGMs sector in Zimbabwe. Be that as it may, basic challenges such as the availability of electricity need to be addressed if the technological innovations are to bear fruit. Recommendations by Abrenica and Tescon (2003) where they proposed a national technology agenda in the Philippines are relevant to the PGMs sector; they went on to argue that infrastructural upgrades are complementary to the national strategy. This agrees with the findings from the study participants.

### **Distribution channels**

Exported PGMs concentrates and matte are bulky products which require a cost effective means of conveying them to their destinations. The findings revealed that all three entities are transporting the products through road through the Beitbridge border post. Six of the participants were of the view that transporting the platinum matte and concentrates through road increases costs, it would have been better to utilise rail transport as it is most cost effective. However the railroad infrastructure is limited and the NRZ does not have adequate capacity at the moment. The Case 2 Interviewee 1 stated that the government should work on the rail transportation as it relatively cheaper as compared to the road. The M.O.M key informant also concurred that the railways are a better option to transport the platinum products; he lamented the fact that the NRZ was not well equipped to handle these exports.

The data gathered shows that the border clearing causes scheduled delays thereby increasing the cycle of delivery and lost time. The customs delay therefore negatively affects how much the entities will be able to export, as sometimes trucks spend time at the border, resulting in demurrage costs to the exporters. The PGMs exporting companies are therefore making arrangements with the Zimbabwe Revenue Authority (ZIMRA) to pre clear the trucks before departure in order to reduce border post delays. Gilaninia (2013) propounds that for the distribution channel to positively contribute towards export

performance, it should be cost effective and efficient. The Zimbabwean PGMs channel of exporting the products is expensive and prone to processing and clearing delays hence the factor is negatively affecting export performance levels.

The findings on the distribution channels tend to support the findings from the research by Fugazza (2004) where he argued that lack of proper transportation system slows down export performance. Fugazza went further to quantitatively test the effect of internal transport infrastructure, represented by the percentage of paved roads, on exports performance and produced positive and significant relationship.

### **Level of processing**

The findings indicated that only Case 1, exports the products as PGMs matte after smelting. Case 2 and Case 3 only export the PGMs concentrate products to South Africa for further processing. The level of processing therefore limits the amount of revenue generated from the exports. The three mining entities have contracts stipulating the revenue receivable which is a percentage of the value based on the international market prices. On average the three mining entities realise 80% of the market value from the assayed metals, and losing out on the other 20% of the value as a result of failure to process until the refinery stage. This observation is therefore a factor that negatively affects the export performance for the sector.

Gilaninia (2013) and Katsikeas et al. (1997) concluded that export performance is positively influenced by the level of value addition embarked on. The more value addition invested in a product the more it will contribute to export performance. The findings supports these conclusions since the firms realise less due to the exporting of semi processed PGMs products. In order to process up to smelting there are various factors that should be considered such as electricity availability and skills required these will be fully discussed in the beneficiation section.

#### **4.3.1.2 Firm specific characteristics affecting export performance**

There are a number of firm specific characteristics that affects export performance. A number of them are firm size, firm age, ownership structures and organisation's international experience (Katsikeas et al., 1997; Sousa et al., 2008). The conceptual

framework for this study focused on company size and the ownership structures and international competences for the PGMs entities with the aim being to determine their effects on export performance. The findings on these aspects are as discussed below.

Empirical evidence from the previous studies has not been conclusive on the effects of firm size to export performance. The three firms can be classified as relatively large in size based on the number of employees and revenue generated. The findings however indicated that based on the mining industry standards the firms still have the potential to grow. Case 2 interviewee 2 indicated that the limitations in the sizes of the plants creates capacity constraints on the entity thereby limiting the total output that can be exported at any given time regardless of the PGMs resources available. The findings also revealed that the foreign ownership and international experience for all three entities contributed positively to export performance these sentiments were expressed by one of the participants as below:

*Zimplats is the largest PGMs mining entity in Zimbabwe, in terms of size. Its size has enabled it to be the first one to process the PGMs up to the smelting stage giving it edge in the market thereby positively affecting export performance.*

*Being part of Implats the second largest PGMs producer, the company benefits from the group scale economies and the markets for the exports are guaranteed hence the export performance and viability for the company is enhanced. Having group shared services is also an advantage as the costs will be lower to a greater extent.*

The sentiments on foreign ownership and international experience are applicable to the other two entities as Unki is controlled by Anglo American, the number one PGMs producer worldwide, the participants concurred that this advantage enhances export performance and guarantees the export market availability. The same applies to Mimosa which is jointly owned by Acquires and Implats.

#### **4.3.1.3 Industry factors affecting export performance**

The data gathered sought to find out how the industry specific factors affected the export performance of the PGMs. Under this theme the stability of the industry, risk levels, and the levels of competition were considered the findings and discussions are as below.

## **Industry stability**

According to the study findings from all the cases, the local PGMs entities have not been there for too long; this means that the sector is still developing in order to become a strong pillar of the economy. The PGMs mining entities and the operating mines are still few hence there is need to increase the number of players in order to boost throughput and ultimately boost export performance. The market for the PGMs is volatile thereby making the sector susceptible to price falls as is the current case where the platinum has gone under \$1 000 from the peak of \$1 700. Case 1 interviewee 3 submitted that the PGMs exporters are price takers hence they are negatively affected by the market movements which reduce the metal prices.

Robertson and Chetty argued that a stable industry encourages export performance; this is not the case with the Zimbabwean PGMs industry as there are a number of concerns. Case 2 interviewee 1 and Case 3 interviewee 2 pointed out that policy inconsistencies and the threat of the 15% tax have affected the foundation of the industry in a negative way. It is therefore important for the industry representatives and the policy makers to work towards stabilising the sector locally thereby removing some barriers to entry and attract new players.

## **Competition**

The number of the entities in the Zimbabwean PGMs sector are only three, the participants emphasised the need for the sector to have more players as this will increase output thereby increasing the export performance. The participants pointed out that the existing mines do not compete with each other as each of them already has guaranteed markets for the export product. Case 3 Interviewee said that “the players in the Zimbabwean PGMs sector are more of partners rather than competitors”. The M.O.M key informant agreed that there is need to increase the local players to boost export performance and support the case for the setting up of the refinery locally.

Reviewed literature was not conclusive on the impact of competition on export performance. O’Cass and Julian (2003) concluded that low industry competitiveness is positively related to export performance. On the other hand Morgan et al. (2004) indicated

that the factor is not significant, while Lages and Montgomery concluded that a high level of competitiveness is positively related to export performance. Based the study's analysis the impact is insignificant as there is no rivalry to talk about between the PGMs producers in Zimbabwe and no effect on the market place.

### **Risk levels**

The impact of risk are minimal on export performance, Case 2 Interviewee stated that the fact that there is not much that one can do with the concentrate if hijacked in transit. In addition the companies are covered through insurance, thereby making risk of losses in transit to be minimal. Case 1 Interviewee 3 concurred that the risk levels in the industry is low hence there is no significant impact of export performance. The operational and cross border risks are manageable, the risk that have the capability of crippling the export is the risk of takeover. The M.O.M informant stated that the industry is relatively low risk and indicated that the miners have earned their license to operate, they are in compliance through payment of ground rental fees and in addition they are obliged to comply with the environmental regulations which they do.

#### **4.3.1.4 Macroeconomic factors affecting export performance**

The macroeconomic factors are also another supply side theme that the study sought to evaluate and determine their effects on the PGMs sector's export performance over the post dollarisation era. The study focused on interest rates, exchange controls, access to capital and the electricity and water availability and cost conditions. The findings, interpretations and discussions on these factors are presented below.

#### **Interest rates and access to capital finance**

All the participants including the key informant were of the view that that the local financial sector is characterised by high interest rates thereby crowding productive sector borrowing. The three PGMs entities have therefore resorted to acquire capital projects funding through their parent companies that have access to foreign financial markets where they can borrow at reasonable interest rates. The groups, however will also be constrained as there are numerous projects to be funded from the pooled financial resources, this results in curtailing of SIB and CAPEX projects for the entities thereby

slowing down export performance in the short and medium term. The high interest rates and illiquid financial services sector, therefore negatively affect export performance. This is so because favourable interest rates in any market encourages local borrowing and productive not only from the mining sector but also the manufacturing sector which is both a key components supplier and customer.

### **Exchange Control measures**

The Ministry of Mines informant commended the Exchange Control environment as being robust and excellent as they facilitate the tracking of export activities while at the same time creates a favourable operating environment for the entities. The MOM informant was of the view that the RBZ Governor's back to basics thrust after the success of the multi-currency system makes the Exchange control procedures fluid yet balanced.

The PGMs firms concurred that the current Exchange Control regime is relatively friendly to business however they lament the cumbersomeness of the demanding procedures with regards to various registrations and acquittals on the imports and services side. The participants compared the current regime to the previous one where surrender requirements forced exporters to lose part of their export generated foreign currency critical for operational and capital needs. Under the current regime all proceeds flow to the exporter without challenges. These views support Sousa et al. (2008) and Cateora (1996) who argued that a friendly exchange control system will encourage more production and export performance. The findings on this aspect imply that the exchange controls are positively enabling export performance.

### **Electricity and water and other infrastructure**

From the study finding this factor is very critical given the operational requirements of water and electricity in the PGMs sector. The M.O.M informant advised that the mining entities have managed to construct dams to supply water for the mines and plants to operate efficiently. This scenario reduces the water supply effect as this is manageable from the point of view of the firms. The informant, however pointed out that electricity remains the major challenge as the country and the region is in electricity deficit scenario.

The three entities concurred that the water challenge is minimal, due to the dams constructed to supply fresh water supplies and for safe reticulation. In order to secure uninterrupted power supplies the companies have made arrangements for preferential supplies with ZESA even though the electricity tariffs are high. The participants from all three companies concurred that the limitation on the power supplies act as a binding constraint to project expansions and more production capacities. This ultimately affects the sector's export performance. Case 2 respondent 1 "availability of electricity is a major challenge. There is need for the government to work on improving the availability of power as it is a crucial input on both the mining and processing plants".

Case 3 participant 2 had this to say "electricity makes the bulk of the operational costs for the company". Case 2 participant 2 said that the electricity costs account for approximately 16% of the total costs which is a significant portion the revenues; this scenario will affect the return and performance of the firm and the sector as a whole. The intermittent power cuts were also cited as a major cost since each time the plants are switched off there will be delays in restarting them. For every minute of power outage there will be thirty more minutes before the machinery are turned back on as there are many checks to be followed. The lost time translates to lost production and at the end of the chain lost export potential. One of the participants proffered the below comments with regards to the infrastructural impact:

*Construction of roads houses, dams are major costs as the level of infrastructure available in the country is low, the company embarked on projects to ensure that its employees are properly accommodated and constructed roads linking its concentrators with the Selous Metallurgical complex where the smelting takes place. Due to this the company spent more resources on infrastructure development which are necessary for the operations even though they do not generate revenues thereby affecting export performance.*

The study results clearly show that the electricity shortages and infrastructure developments are key factors being major impediments to export performance and serious efforts must be put in place to improve on these factors if the output and export performance is to be enhanced. Individual and industry collective actions to curb this limitation are welcome. The observation and comments are in tandem with Fugazza (2004)

who posited that governments and industries especially in Africa must prioritise the significance of power generation and other infrastructures.

#### **4.3.1.5 Government policies and regulations factors affecting export performance**

With regards to the government policies and regulations factors the study sought to evaluate the following factors: taxes, mining incentives, environmental regulations and mining regulations. The presentation, analysis, interpretation of the effect of these four factors is discussed below.

##### **Taxes**

The issues investigated under taxes are the corporate tax rates, royalty tax, value added tax (VAT) and the possible impact of the 15% tax on non-beneficiated platinum. All respondents revealed that the corporate tax rates are favourable with the rate for Special Mining Lease (SML) levies at 15% and 25% for the rest. Two of the Cases namely Unki and Zimplats are holders of SML, while Mimosa is not, however the threshold of exports under the Minister of Finance's incentives from the 2015 Budget reduced the rate applicable to Mimosa to 15%. Accordingly the corporate tax rate has positive but insignificant effect on export performance.

The royalties' rates are fixed as a percentage of revenue generated. Case 2 participant 1 posited that the royalties' rates should be linked to the international market prices on a sliding scale. The sliding scales ensures that sustainability of the mining firms is not affected when the prices are down and ensuring that the tax collectors realise more in times of price booms. The same participants lamented the refund period on VAT claims which is not per the Value Added Tax ACT. The participant said that this creates a funding and working capital challenge for the entity. The same sentiments were echoed by three other participants.

The 15% tax on non-beneficiated platinum affects two of the Cases with Zimplats excluded since it exports PGMs matte after smelting. All participants indicated that the tax has the potential of crippling the operations of the existing affected companies and create a serious barrier to entry for potential new entrants. One of the participants commented as follows:

*The 15% tax on non-beneficiation PGMs will erode profitability, and make it very unsustainable for the two affected mining entities to be operational in the short to medium term. The tax also has the effect of creating an entry barrier for new entrants as the business venture will not be beneficial given huge capital injections required in PGMs mining.*

The M.O.M key informant agreed with the other participants on the observed effects of the tax regime and expressed optimism that the ongoing negotiations on 15% tax on non-beneficiated platinum will lead to a breakthrough that will sustain the industry. His sentiments were “negotiations are ongoing between all interested parties, our part as the parent ministry is to prioritise the suitability of the mining sector, and we envisage a win-win outcome”. With regards to taxes the study interpreted that the 15% tax is the major threat which has negative effect on export performance.

### **Mining incentives**

The study also sought to establish and evaluate the incentives in the mining sector’s effects to export performance. The findings focused on the corporate tax incentives, the rebates on imports and duty exemptions that may be utilised by the mining entities. The M.O.M key informant discussed in-depth the incentives that are at the PGMs sectors disposal in order to encourage the sustainability of the sector and capital injections. The representative indicated that the corporate tax rate applicable to SML holders is 15% which is a huge incentive given that other players are taxed at 25%.

The key informant also shared that the government is in the process of crafting a new mining policy which is intended usher in improved and competitive legislative framework for the mining sector, thereby ensuring a friendly operating environment, enforce the use it or lose it principle, and make the sector more investor friendly and address legislative gaps between mining and minerals laws and other laws that affect the mining sector. The incentives that the M.O.M informant believed positively affect export performance are as below:

Capital expenditures incurred by mining entities for the development of mining operations are one hundred percent deductible. In addition the mining houses are able to indefinitely

carry forward assessed tax losses. New investors in the sector are allowed to acquire capital locally through borrowing in order to finance working capital and expansion projects. Rebates and suspensions of duty are granted to mining entities per the Customs and Excise regulations on the basis of: being SML holders, holders of exploration title, imports for approved projects, temporary imports to be used on approved projects and imports that are exclusively for mining development and expansions. The key informant argues that these incentives have a positive bearing on mining operations and ultimately export performance.

The participants from the companies were also asked questions on the incentives and they all expressed knowledge on the above discussed incentives. The participants indicated that their organisations utilised the appropriate incentives at some point thereby deriving the benefits applicable. The participants concurred that the incentives have positive and significant effects on the operational and capital expansions required in the production and exports of PGMs. From the data analysis it is quite clear that the mining incentives have a positive impact on export performance. The incentives should stay in place if the PGMs sector is to remain afloat, they also provides an entry attraction for potential new entrants.

### **Environmental and mining regulations**

The participants concurred that there are inconsistency between the environmental regulation and mining regulation. In addition the costs of environment fees are too high thereby affecting the viability of the mines and creating a barrier to entry. Case 2 Interviewee 3 said that the ground rental fees and export license fees are too high and the procedures of renewing them regularly create unnecessary pressure given that the lives of the mines are known. The regulations therefore do not encourage production and export performance for the PGMs sector.

### **Indigenisation policy**

Case 2 participant 1 was of the strong view that the indigenisation and Economic Empowerment implementation has affected the commitment of many firms to remain invested in Zimbabwe. The participant was of the view that the indigenisation policy has

the potential to drive out potential and existing firm. The participant went on to cite cases of multinational companies which discontinued operations as below:

*Indigenisation has scared a lot of big companies leading to massive investor flight for example Rio Tinto, Esser and Costain International are the few examples of companies that have left the country. There are incoherent political and economic strategies that are destroying the industry.*

This was an emergent factor which was not conclusively assessed in terms of how it has the potential to affect PGMs sector export performance. Accordingly it can be the subject of further research in future.

#### **4.3.2 Demand side factors affecting export performance**

In addition to the supply side factors discussed above the study sought to assess the factors that have effect on the PGMs export performance from the demand side. The factors that were assessed are: access to the export markets, the level of competitiveness, barriers and ease of entry in the market, metal prices and the global economic environment.

##### **Access to export markets and barriers to entry**

All the participants agreed that the companies do not face restrictions on access to the export market. All the three entities have standing agreements with the buyers of their products that guarantee that all produced and exported PGMs products will be accepted without challenges, and paid for at the agreed time. The interpretation is that the ease of export market accessibility and guaranteed exports is a factor which positively affects the Zimbabwean PGMs sector export performance. The observation and interpretation is in line with Dean et al. (2000) and Cavusgil and Zou (1994) who propound that the easiness to access market and low barriers to entry is positively related to export performance.

The PGMs export markets are not characterised by entry barriers. The market is an open market for all and its trading conditions are affected by the forces of supply and demand. These sentiments were echoed by six of the participants, and based on these observations the study is of the view that the openness of the market creates a positive relationship to export performance. The level of significant is however open to debate.

## **Competition**

Literature has produced mixed findings on the relationship between the level of competition and export performance. Fugazza (2004) and O’Cass and Julian (2003) argued that low competition markets are positively related to export performance. The forces of demand and supply are affects the volumes and prices of the PGMs in the international markets. The emergent of recycling of platinum from scrap auto catalyts and R&D focusing on finding substitutes of platinum has had negative effect on the metal prices, due to low demand which translate to reduced revenues for the PGMs exporters and export performance.

## **Market prices**

As alluded earlier the PGMs prices have negatively affected the export performance for the Zimbabwean PGMs mining entities. This was supported by all the participants, one of the participants commented that “...given that us as exporters of the PGMs are price takers; the international markets are always volatile. The recent global economic downturn and the developments in platinum recycling and substitutes have made the platinum price to plummet from \$1 700 to current prices hovering around \$1 000. This situation has eroded revenue generation and profitability hence negatively affecting export performance’.

The low international market prices have no doubt negatively affected export performance and even the sustainability and attractiveness of the Zimbabwean PGMs sector. Coupled with the supply side negative determinants the effect on export performance is dire. All participants agreed that the prices are a negative factor on export performance.

## **Global economic environment**

The participants were of the views that the global economic environment has led to deteriorating prices and ultimately low revenues and reduced export performance for the PGMs mining and processing companies. One of the participants had the following sentiments below regarding the global economic environment.

*The global economic environment has had major negative impact on the PGMs exports, the economic downturn saw the major markets for the final products which happened to be mainly Europe, Japan and China reducing their demand for*

*PGMs hence pushing the metal prices down with current Platinum prices falling below \$1000 from the high prices of \$1 700 per ounce. The falling prices have caused dire effects on the Zimbabwean PGMs sector.*

Having sought data and analysed the demand side factors, the study has established that the factors are equally as important as the supply side factors. The impact of prices has been negative on the PGMs export performance in the recent past and is expected to remain like that into the future. It is important however, to point out there is not much that can be done by the Zimbabwean players to influence the demand side factors, yet they can influence the operational environment, company specific factors and lobby for policy makers to consider their inputs.

#### **4.3.3 Constraints and enablers of PGMs beneficiation**

To address the third research objective the study sought to identify the beneficiation constraints and enablers in order for appropriate conclusions and recommendation to be made. The factors that the study sought to understand were raw materials, infrastructure levels, research and development, skills levels and costs, international market access and electricity and water. The findings on these themes are presented, analysed, interpreted and discuss below.

##### **Raw materials**

All participants indicated that the mineral ore raw material is abundant and accordingly will not present a constraint to beneficiation. The ore reserves is an enabler to the beneficiation to beneficiation, the same sentiments were supported by the M.O.M key informant. The consumables required to run the processes will however be limited as most will be imported thereby creating a constraint according to the finding from the participants. Below are some of the comments from the participants with regards to the issue of raw materials:

*Raw materials contribute positively given that the Great Dyke boasts of abundant PGMs resources. However the consumables will mainly be imported hence they will be costly as they will include transportation costs. The government will also need to extend rebate and duty suspensions to critical beneficiation inputs.*

*Raw materials are not a major problem but the challenge is that of the sustainability of mining and processing the resources that we have and realising returns. This is so because the company does not have control of the market prices and that the cost structures are also relatively high.*

The sentiments support the findings by UNECA (2011) that Africa is relatively well endowed with the commodity resources hence the issue of the ore reserves is not a major challenge when it comes to beneficiation. The major concern is on acquiring the proper technology and vital inputs to enable the value addition process to succeed. The fact that refineries will require minimum levels of feedstock in order to effectively and efficiently operate makes it imperative for the players to increase throughput to significant levels.

### **Infrastructure**

In line with Mudd (2010), the findings indicate that there is a positive relationship between the level of infrastructural development and beneficiation. Poor road and rail network, and the sophistication at the ports of entry and exit were the major cited factors as constraints to beneficiation. All participants were in agreement that the infrastructural shortcomings in the country results in a major constraint to the beneficiation movement. The M.OM. Informant held that the current infrastructures are not able to facilitate efficient and effective PGMs beneficiation within Zimbabwe.

One participant indicated that the economic slowdown before 2009 stalled the much need infrastructural developments, resulting in the country being incapacitated to embark on PGMs beneficiation given the output being produced by the mines. There is also a constraint on the mining entities to fully develop the required infrastructural developments from own resources given the high costs in the industry and the falling market prices. The findings support the conclusion by Hawkins (2009) that the level of infrastructural facilities within a nation provides a constraint or enabler to growth and beneficiation.

### **Research and Development (R&D)**

The study findings pointed out that there is relatively low R&D in the Zimbabwean environment. This therefore inhibits the breakthroughs and initiatives that enhance efficiencies and reduce production costs. The limited levels of R&D thus become a

beneficiation constraint, all participants agreed on this aspect. Below are some sentiments on R&D from the research participants:

*The levels of research and development in the country is very low, this therefore is a constraint on the beneficiation as such ventures require adequate planning and feasibility studies to ensure success of beneficiation focus.*

*There is inadequate R&D in the industry which suffocates beneficiation of PGMs*

The findings validates the fact that lack of research and development within a nation slows down growth and efficient utilisation of the available resources to add value and realise more through the exporting of the final finished goods. R&D is therefore a constraint to Zimbabwe's PGMs beneficiation (Soko and Bulchin, 2012; Hawkins, 2009).

### **Skills levels and costs**

MISTRA (2013) argues that mineral beneficiation requires skilled and well equipped labour force in order to achieve success. The skills levels in terms of artisans are limited in the local market, yet they are crucial to beneficiation success (Soko and Bulchin, 2012). The skills shortages are a constraint Case 2 Interviewee 2 stressed that "The sector requires hands on people in the form of artisans and engineers rather than simple graduates". The labour costs in Zimbabwe have been high since the introduction of the multicurrency system. Other sentiments from the participants on the skills requirements and cost thereof are as shown below.

*The brain drain within the labour market creates a constraint in attracting the desired skills that push beneficiation, the supply from the training institutions have decreased. There are shortages of engineers, and artisans who have the capacity to drive beneficiation attracting expatriates is also costly and crowds out the local manpower*

*The manpower to operate the refineries is limited hence being a constraint to the beneficiation of the PGMs*

*The education sector is producing graduates and not hands on people. The government institution that trains artisans, engineers diesel engines operators have since closed. There is a high cost of training manpower.*

The findings indicate that there is a shortage of the relevant skills that are appropriate to drive value addition in the PGMs sector. Relevant training of the artisans and engineers must be a major priority if breakthroughs are to be made on this aspect. These findings are in line with the argument by MISTRA (2013) above where it is emphasised that skilled and equipped human capital is critical to drive beneficiation.

### **International Market access**

The geographical location of Zimbabwe relative to the international markets is a constraint to beneficiation (Hawkins, 2009). The fact that the local PGMs mining houses have not been processing the metals to the final stages, limits their access to markets for beneficiated products. Regionally there is no developed market for the beneficiated PGMs products with South Africa being the only nation with a growing industry. The participants however, that in the case of beneficiation the group wide established markets can be tapped into without a challenge, hence the market access concern will not be a major barrier. Accordingly the ability for the Zimbabwean firms to access the markets already developed by their parent companies eliminates the constraint.

### **Electricity and water**

The regional and country specific shortage of electricity was cited by all participants as the major constraint. This observation is in line with Hawkins (2009) and MISTRA (2013) who concluded electricity is a major binding constraint which requires special attention and to be holistically addressed if beneficiation success is to be realised. Case 2 Interviewee 1 indicated that the power requirement for a refinery exceeds the current national demand. Accordingly the participant stressed the electricity factor must be addressed first before construction of the refinery in Zimbabwe.

Setting up beneficiation plants without addressing the electricity generation capacities will not help the situation. It is important that this binding constraint be addressed first before further beneficiation which is sustainable is undertaken. Uninterrupted power supplies are

important as downtimes due to power outages are costly. The results indicate that electricity is a major input required in PGMs beneficiation hence the companies and the government will need to invest in these critical areas if beneficiation is to be realised in the long term.

#### **4.4 CHAPTER SUMMARY**

Chapter four presented, analysed and discussed the results from the interviews carried out in the field work. The discussion was split in such a way that the three research questions are addressed. The supply side factors affecting export performance and the demand side factors affecting export are discussed with the study identifying and assessing the effects of the breakdown of the factors. PGMs beneficiation constraints and enablers were discussed in the final section. Chapter five will address the study conclusions and important recommendations.

## **CHAPTER 5**

### **CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 INTRODUCTION**

This chapter presents the conclusions and recommendations emanating from the study. The conclusions flow from the interpretations and discussion of the findings and the relevant literature. The recommendations are based on the major conclusions and these provide both managerial and policy implications. The chapter will also highlight the main limitations to the study before concluding with the discussion of areas of further research and insightful directions.

#### **5.2 MAIN PURPOSE AND IMPORTANCE OF THE STUDY**

The main purpose of this study was to determine and evaluate the factors that affect the PGMs sectors export performance. These factors were split into two, namely the supply side and demand side factors. In addition the study sought to identify and assesses the constraints and enablers to PGMs beneficiation in Zimbabwe. Appropriate conclusions and recommendation were derived from the research findings.

The study explored mining sector export performance and beneficiation in Zimbabwe with special focus on the PGMs sector. The study is important since there have not been similar studies carried out in this sector. Gwabva (1998) carried out a quantitative research on the Zimbabwean manufacturing sector's export performance. This study therefore enabled the identification of major factors affecting exports and beneficiation resulting in appropriate recommendations applicable in the short term, medium term and long term with the key responsible persons identified. The existing PGMs mining entities, potential new entrants, the government and the nation at large will benefit from the study.

## **5.3 STUDY CONCLUSIONS**

### **5.3.1 Supply side factors affecting export performance**

#### **5.3.1.1 Operational factors**

The labour force for the PGMS sector is readily available. Accordingly the study concludes that the acquisition and deployment of labour force does not negatively affect export performance. The training and skills level are the major challenges as PGMS mining and processing require the expertise of artisans and engineers who have the hands on skills. There is skills shortage and training teams is costly and time consuming. The closure and sub-optimal mining training grounds must be equipped; the mining entities must also allocated appropriate budgets for required training in the short and medium term to ensure continuity.

The nation has a huge PGMS reserve base. This make the reserves factor to have positive impact on the export performance since output can be trebled provided appropriate equipment and labour force is available. The challenge is on mining and plant consumables which are imported hence costly. The local manufacturing sector is not equipped to supply these crucial inputs. There is need to revive the manufacturing sector as it is a critical supplier of the required consumables and mining customer.

The companies are not accessing substantial finance from the local financial services sector. Capital financing comes from the group pooled resources which are limited as they cater for a number of competing projects. This makes it difficult for the PGMs mines to adequately cover the operational, SIB and capex requirements to improve export performance and beneficiation. The companies utilises automated mining techniques and the plants are also technology driven with limited human interaction. This has a positive influence on production and export performance. The technological investments will require adequate support in terms of power supplies and skilled manpower. Low levels of research and development and funding affect the investments in beneficiation and export performance enhancing projects.

The use of the road to transport the products to the exports market is costly. The conclusion is that efforts should be made to revive the railway mode of transportation of the products on a cost effective manner. Pre clearing of the export is the way to go as this

will reduce time taken at the border thereby delaying exports. The current distribution channel negatively affects export performance due to costs and delays. The level of processing has the impact of reducing the potential revenue received by the PGMs exporters. Two of the entities are affected by the 15% tax as a result of their exporting PGMs concentrates.

#### **5.3.1.2 Firm specific characteristics**

Plant capacity limitations create a constraint on the total output that the firms are able to export even though the ore resources are available. The firms however, derive positive results from being part of well-established foreign PGMs industry players. The firms are able to export all their products without facing market challenges.

#### **5.3.1.3 Industry specific factors**

The industry is characterised by few players resulting in limited output due to plant limitations. New players are required in the PGMs sector in order to increase throughput. The volatility of the market has affected export performance due to the falling prices on the market has affecting sustainably and new entrants attraction. Policy inconsistencies and viability threats on the industry, especially the 15% tax are major concerns to stability. The risks level in the sector is minimal as the firms are properly insured the only major worry is the Indigenisation and Empowerment ACT, and the takeover threat.

#### **5.3.1.4 Macroeconomic factors**

The market is characterised by high interest rates, which have made it challenging for firms to borrow locally to finance operational and capital projects. The exchange control measures are not a big challenge, hence the PGMs firms are able to manage these without affecting export performance negatively. Some of the procedures may need revisiting so that they are not complex though.

Electricity generation capacity is insufficient to cater for the nations' requirements. Power is a major component and cost driver for the processing plants. Electricity supplies are a binding constraint to project expansions in the medium to long term. Other infrastructural shortcomings such as road, rail and ports of entry and exits are negatively affecting export performance as well.

### **5.3.1.5 Government Policies and Regulations**

The corporate tax regime is favourable and encouraging, however there is a challenge on VAT collections from ZIMRA where there are not paid on time thereby creating cash flow challenges for the entities' operations. Fixed rates of mineral royalties are not progressive as they have the potential to threaten the sustainability of the industry in times of price recessions. There is overwhelming evidence supporting the notion that the 15% tax on non-beneficiated platinum will threaten the sustainability of the existing firms, especially given the prevailing prices. The tax also creates a barrier to entry which does not assist in increasing throughout.

There are a number of incentives in the form of rebates and customs duty exemptions, capital expenditure redemptions and the indefinite carryover of assessed tax losses that encourage mining and ultimately have positive effects on export performance. There is need to ensure that the incentives continue to exist so as to encourage production and performance.

### **5.3.2 Demand side factors**

Export market access is guaranteed through the agreement to export the PGMs products, which ensures that the firms can export all the quantities they produce. Market access therefore positively affects export performance for the PGMs in Zimbabwe. The market does not have any barriers to entry as it is an open market driven by the forces of supply and demand. Accordingly the conclusion is that the absence of the entry barriers encourages export performance.

Europe's efforts on recycling platinum and finding substitutions for the metal, has had negative effects on metal prices for exporters. In addition, the slowdown on economic activities globally and the introduction of recycling has led to very low market prices. The international metal prices factor has significantly and negatively affected export performance for the Zimbabwe PGMs entities through reduction in revenue generated.

### **5.3.3 Beneficiation constraints and enablers**

The ore reserves are abundant hence they are an enabler of beneficiation as feedstock can be guaranteed given proper and running beneficiation, consumables and human capital. The country has infrastructural deficits that are negatively effecting value addition. The companies have had to commit more resources on the infrastructural needs of the operations thereby taking away resources that can be committed to beneficiations. Research and development is also important to beneficiation. The low levels of R&D are crippling the potential for more PGMs beneficiation in Zimbabwe. The skills gap provides a beneficiation constraint; the costs of attractions the relevant skills are high. Most training centres are no longer operational thereby making the skills gap a major challenge on the medium term.

Beneficiation requires the setting up of refineries. The requirements for electricity to run refineries are high and it is constrained by the shortages of electricity power within the region and Zimbabwe. Electricity is a major binding factor to beneficiation. The refinery demand for power exceeds the current demand for the country as a whole hence talk of setting up refineries should not come before the power generation situation has been addressed.

## **5.4 RECOMMENDATIONS**

As a result of the conclusions on findings above, the study presents the following recommendations on export performance enhancement and beneficiation of PGMs:

### **5.4.1 Electricity Supplies**

Electricity came up as a major constraint to beneficiation and production as the mines and processing plant heavily rely on power supplies. The recommendations are for the government to prioritise power generation that adequately cater for the national demand. The coal and hydro resources in the country should be used to generate more electricity for the manufacturing and mining sector.

In the medium to long term, public private partnerships should be utilised in order to increase the electricity generation capacities. The mining entities themselves must also set

up budgets for power generation pool resources in the medium to long-term to generate own electricity which they may sell to the national grid or even export periods of excess.

#### **5.4.2 Labour and Skills**

Skills have been identified as being critical to production and beneficiation. The study recommends that training institutions that offer the required skills and knowledge that drive mine production and value addition be set up and supported. The government must play a critical role and the productive sectors encompassing mining should support the skills development financially and through other resources. A competent labour force will assist in driving productivity, research and development and beneficiation in the long term. A national skill strategy that is in line with the industries requirements must be crafted and implemented in the medium to long term.

#### **5.4.3 Infrastructure**

Strengthening of the infrastructures is a critical factor for production and value addition. The study recommends that the government must continue and increase public, private partnerships (PPP) for the construction of roads, railways and refurbishment of port of entry and exits. The railways is a cost effective means to transport bulky products, therefore the government should prioritise of and put aside funds for the resuscitation of the NRZ. In order to achieve this government should ensure that budget capital allocations are increased in the as apposed in the current scenario whose recurrent expenditure eats up the bulky of the expenditure. Infrastructure needs over the next ten to twenty years must be identified and worked on.

#### **5.4.4 Production**

The mining entities should leverage on the resources of PGMs available, through increasing output. Increasing production capacities of the mines and concentrators in the short term is critical to enhance production and export performance. In the medium term smelters must be strategically set up to process the feed stock from the concentrators thereby ensuring that the revenue generated will be much higher than the current levels. In the long-term provided there are adequate power supplies a refinery will need to be set up so that full beneficiation is achieved resulting in exporting valued added products and

supplying the manufacturing sector with products for further beneficiation. Strict cost control measures must be instituted in order to shield against falling prices.

#### **5.4.5 Tax on non-beneficiated platinum**

The study recommends the suspension of the tax until such a time that an enabling environment in terms of output, power supplies and infrastructure are conducive for extensive value addition. The deferment of 15% tax on diamonds is a positive move and the same should be done if the PGMs sector is to survive.

### **5.5 LIMITATIONS OF THE STUDY**

The study focused only on three entities in the mining sector. This limits the generalisability of the research findings to the whole Zimbabwe mining sector as the operations of the PGMs sector and pertinent factors affecting it may differ with other minerals such as gold and diamonds. The study results are in the context of the Zimbabwe PGMs sector for the period 2009 to 2015 and cannot be easily generalised to other contexts.

### **5.6 TESTING THE RESEARCH PROPOSITION**

The research findings and conclusions indicated that beneficiation of PGMs in Zimbabwe is constrained by various factors especially electricity and skills. This conforms to the proposition with regards to beneficiation. Contrary to the proposition that stated that supply side factors have more impact on export performance when compared to the demand side factors, the international metal prices (supply side) were proven to be very critical to export performance.

### **5.7 AREAS OF FURTHER RESEARCH**

Further studies should be carried out to assess causal effects relationship between the various factors and export performance and value addition for the mining sector as a whole through quantitative approach. This study being an exploratory study sought to identify and bring out the factors that are at play. It is also relevant to carry out a study on the

business case of PGMs beneficiation in Zimbabwe and evaluate the appropriate business models for the Zimbabwean scenario.

## **5.8 CHAPTER SUMMARY**

This chapter is a critical part of the study as it sought to sum up the research through conclusion and recommendations. The chapter ran through the conclusions for each research objective before making appropriate recommendations for the major conclusions. The chapter also discussed the study limitations in terms of generalisability of findings and evaluated whether the research findings were in line with the proposition stated in chapter. The areas for further research were discussed to sum up the study.

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## APPENDIX 1

### PLATINUM



Source: Anglo American (2013)

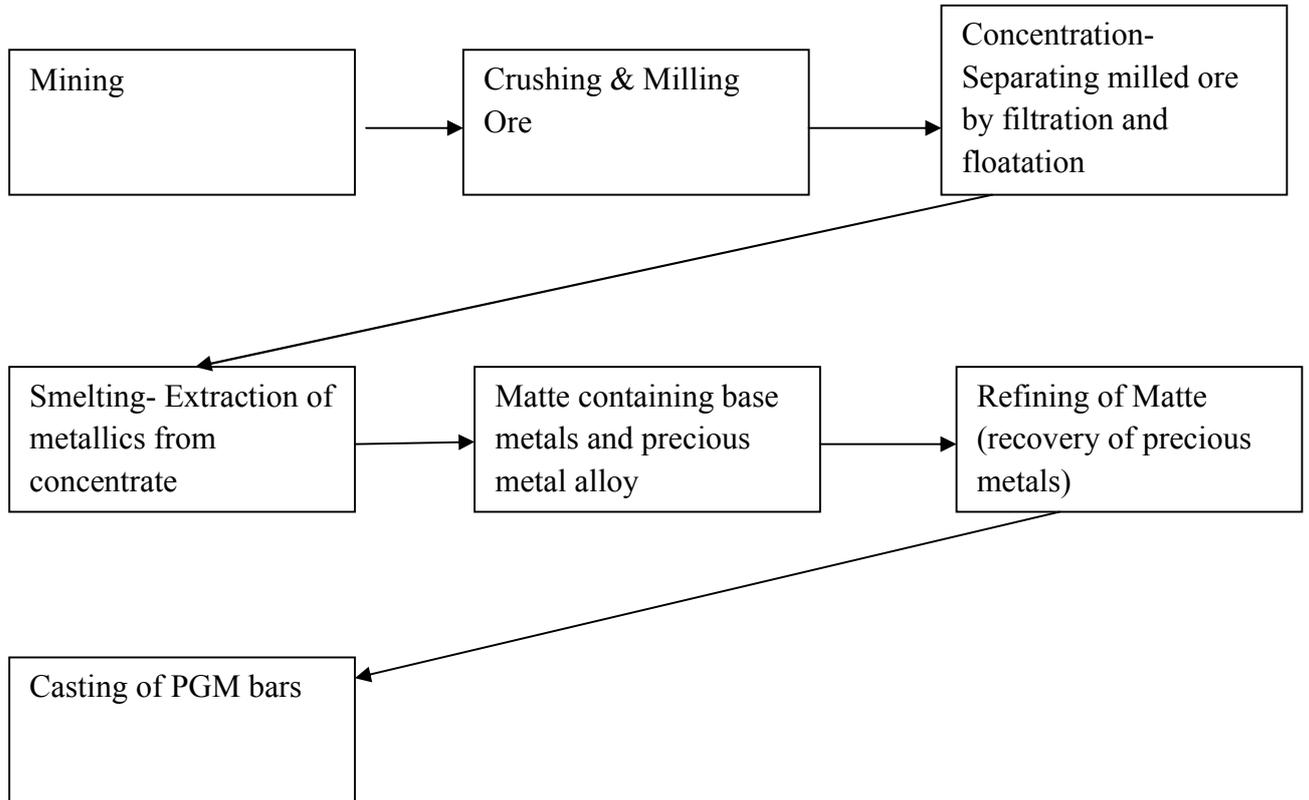
## APPENDIX 2

### CATALYTIC CONVERTER



### APPENDIX 3

#### PGMS VALUE ADDITION CYCLE



## APPENDIX 4

### INTERVIEW REQUEST LETTER



4230 Unit D  
Chitungwiza  
20 June 2015

**Dear Sir / Madam**

RE: ACADEMIC RESEARCH INTERVIEW APPOINTMENT REQUEST

My name is Abisha Mujuru student number R014876X, and I am a University of Zimbabwe Master of Business Administration (MBA) student carrying out a study on **the evaluation of the factors affecting export performance and beneficiation of Platinum Group Metals (PGMs) in Zimbabwe**. The main aim of the study is to evaluate the factors that affect the PGMs sector's export performance and identify constraints and enablers of beneficiation and make appropriate recommendations.

I therefore kindly request your permission to carry out three in-depth interviews with three suitable senior management personnel from your organisation as part of the data collection process. Please note that the responses will be used for academic purposes only and will be treated with highest level of confidentiality.

For any clarifications regarding this study, please feel free to contact this researcher on 0775120019 or on this email [abisha.mujuru@angloamerican.com](mailto:abisha.mujuru@angloamerican.com). Your cooperation and assistance is greatly appreciated.

Yours faithfully

Abisha Mujuru

## APPENDIX 5

### INTERVIEW GUIDE FOR CASE PARTICIPANTS

#### **Supply side factors affecting export performance**

1. What are the operational factors affecting your organisation's export, and how do they affect the level of export. **Focus on Human Resources, Finance, Raw material (Sources and costs), Technology, distribution channels and level of processing.**
2. What are the industry specific factors affecting export performance. **Assess industry stability, risk levels and competition.**
3. In your view does the company size and ownership structure affect export performance for PGMs? If yes how do these company specific characteristics affect performance?
4. What are the macro-economic factors that affect export performance and what have been their effects over the past five years. **To probe on interest rates, exchange controls, access to capital and water and energy on company performance**
5. What are the factors related to government policies and regulations affecting export performance and how have they affected the company's exports. **To probe on Taxes corporate tax, royalties, VAT; Rebates and other mining regulation, environmental regulations incentives.**
6. Would you please discuss any factors not covered above that affect PGMs production and exports?

#### **Demand side Factors**

7. Does the company face export market access challenges, if yes what are the challenges and what's their effect on exports?

8. What has been the impact of the global economic environment on the performance of the entity?
9. What is the impact of international market prices for metals on export performance?
10. Would you please discuss any factors not covered above that affect PGMs export performance through affecting the demand side?

### **Beneficiation constraints**

11. What are the constraints on PGMs beneficiation in Zimbabwe? **Focus on raw materials, infrastructure, research and development (R&D), skills levels and availability, and access to the markets**

### **Recommendations**

12. What recommendations can you suggest to improve the export performance of PGMs in Zimbabwe, within the short, medium and long-term? **To probe on time frame of recommendations and the parties responsible for implementing the recommended facts.**
13. What recommendations can you suggest to improve the levels of beneficiation of PGMs in Zimbabwe, within the medium and long-term? **To probe on time frame of recommendations and the parties responsible for implementing the recommended facts.**

## APPENDIX 6

### INTERVIEW GUIDE FOR MINISTRY OF MINES

#### **Supply side factors affecting export performance**

1. In your view what are the operational factors affecting the Platinum group metals export performance, and how do they affect the level of export. **Focus on Human Resources, Finance, Raw material (Sources and costs), Technology, distribution channels and level of processing.**
2. What are the industry specific factors affecting Platinum export performance. **Assess industry stability, risk levels and competition.**
3. What are the macro-economic factors that affect export performance and how do they have impacts on the PGMs exports. **To probe on interest rates, exchange controls, access to capital and water and energy on company performance.**
4. What incentives does the Ministry of Mines and the other government arms extend to PGMs miners in order to enhance export performance
5. In your view how will the 15% tax on non-beneficiated platinum affect the sectors export performance?

#### **Demand side Factors**

6. What has been the impact of the global economic environment on the performance of the mining sector as a whole and the platinum mines in particular?
7. What is the impact of international market prices for metals on export performance?

### **Beneficiation constraints**

8. What are the constraints on PGMs beneficiation in Zimbabwe? Focus on raw materials, infrastructure, power and water, research and development (R&D), skills levels and availability, and access to the markets

### **Recommendations**

9. What recommendations can you suggest to improve the export performance of PGMs in Zimbabwe, within the short, medium and long-term? To probe on time frame of recommendations and the parties responsible for implementing the recommended facts.
10. What recommendations can you suggest to improve the levels of beneficiation of PGMs in Zimbabwe, within the medium and long-term? To probe on time frame of recommendations and the parties responsible for implementing the recommended facts.