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Impact of reporting codes on the growth of the mining industry in Africa

Steven Peter Garner

A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Business Administration

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ABSTRACT

The South African Mineral Reporting Codes are in place to ensure that mining and exploration companies are reporting exploration results, mineral resources and mineral reserves correctly. In addition, they are ensuring that the public reporting of mineral asset valuations are performed in accordance with regulated norms.

This research was done to assess the impact that the South African Mineral Reporting Codes are having on the growth on the mining industry in Africa.

A qualitative approach to the research methodology was adopted and several domain experts were interviewed until conversion was observed.

Key findings indicated that the South African Mineral Reporting Codes will have very little impact, if any, on the growth of the minerals industry in Africa. Where investment and growth comes from the international stock exchanges, the foreign codes will impact growth, but if investment comes from foreign direct investment then the codes will have little or no impact.

The South African Mineral Reporting Codes have a very important role in the South African context. However, because of foreign direct investment into the African mining industry and funding from international stock exchanges, the international codes are assisting growth in the mining industry in Africa.

DECLARATION

I, Steven Peter Garner, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Steven Peter Garner

Signed at ……

On the …….. day of …… 2015

DEDICATION

I dedicated this research report to my wife, Veronica, to my son, Liam, and to my daughter, Nicola, for their support and patience through my MBA journey.

ACKNOWLEDGEMENTS

I would like to thank my supervisor, Mark Peters, for his assistance and support even though he was no longer a member of the staff at the Wits Business School during the last few critical months before and up to hand in.

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CHAPTER 1: INTRODUCTION

1.1 Purpose of the study

The purpose of this research is to establish the impact that the current SAMREC and SAMVAL Reporting Codes (SAM-Codes) will have on the growth of the mining industry in Africa.

The SAMREC Code is a governance code which sets out the minimum requirements for the reporting of exploration results, mineral resources and mineral reserves (SAMREC Working Group, 2009).

The SAMVAL Code is also a governance code, and it sets out minimum standards and guidelines for Public Reporting of Mineral Asset Valuation (SAMVAL Working Group, 2009).

Both of these codes provide assurance to potential investors as to the level of certainty of the amount, quality and value of mineral assets in the ground.

A very important fact that must be highlighted is that compliance with the SAM-Codes is prescriptive and mandatory for mining and exploration companies listed on, or intending to list on, the Johannesburg Stock Exchange (JSE).

The research was undertaken by firstly understanding if growth in the mining industry is through the JSE and South Africa as the gateway to Africa or through foreign direct investment (FDI). This provides input into the conclusion as to whether the codes are actually adding value to or constraining investment in the African mining industry. It also shows whether the SAM-Codes are being undermined by the foreign mineral codes in Africa.

1.2 Context of the study

Corporate governance is an important requirement for businesses due to fraudulent activities that have taken place in the past.

This fact is just as true in the minerals industry and two mineral reporting codes have been established in South Africa to enforce good corporate governance. These codes are the SAMREC and SAMVAL Reporting Codes.

The SAMREC Code is a governance code which sets out the minimum requirements for the reporting of exploration results, mineral resources and mineral reserves (SAMREC Working Group, 2009). It is very specific in terms of the reporting requirements of Competent Persons' Reports (CPR) for the purpose of informing investors, or potential investors and their advisers. It is important to note that if the sources of capital are not from public sources or banking institutions, then these codes are only used as a guideline.

The SAMVAL Code is also a governance code. It sets out minimum standards and guidelines for public reporting of mineral asset valuation (SAMVAL Working Group, 2009). This code is applicable to the reporting of all styles of solid mineralisation or mineral assets, and it is important to be aware that it does not apply to oil, gas or water (SAMVAL Working Group, 2009). The SAMVAL Code is concerned with the value or worth of a mineral asset rather than its evaluation (SAMVAL Working Group, 2009). Evaluations look at the economic merit of a mineral asset (SAMVAL Working Group, 2009).

If growth of the mining industry in Africa is based in South Africa, through the JSE, with South Africa as the gateway for mining projects in Africa, then these listings will need to be compliant with the SAMREC and SAMVAL Codes. Most overseas countries with large stock exchanges that fund mining projects have similar codes.

Some of these are:

- Australia has the Joint Ore Reserves Committee Code (JORC).
- Europe has The Pan-European Standard for Reporting of Exploration Results, Mineral Resources and Reserves (PERC).
- Chile has the Certification Code for Exploration Results, Mineral Resources and Ore Reserves.
- Canada has the National Instruments 43-101 Code (Ni 43-101).

- The United States of America has The Society for Mining, Metallurgy and Exploration (SME) Guidelines (Baxter, 2011).

In addition, most of the investment banks in South Africa have adopted the South African Codes, while international investment banks have adopted the codes relevant to their stock exchanges. It is important to note that the JORC and Ni 43-101 Codes are also recognised by the JSE and South African banks (JSE, 2013b).

Mining companies are governed by Porter's Five Forces (Porter, 2008) and the SAM-Codes affect them in unique ways.

With the number of emerging market economies, such as the BRIC (Brazil, Russia, India, China) nations, as well as investors from other countries like South Africa, Canada and Australia, there is a huge threat to existing mining companies from new entrants into the African Mining Industry. However, from the mining industry in Africa's perspective, it is potentially an incredible opportunity for growth and upliftment. In this respect, this research report asks "who is" and "who will be" investing in the future of the African Mining Sector. Will the SAM-Codes be adopted and used by these foreign investors or will they use other codes if funded though international stock exchanges, governments and companies?

The SAM-Codes form part of Porter's barriers to entry, along with country political risk, funding risk and nationalisation. Exploration and mining companies will have to spend a significant amount of money on exploration and drilling programs as well as on feasibility studies just to get the mineral resource classification to a high enough standard to fit the requirements of the codes. A mineral resource is divided into three categories depending on the level of geoscientific knowledge and confidence in its grade, tonnage and value (SAMREC Working Group, 2009). These categories are Inferred, Indicated and Measured (See Figure 1).

An Inferred resource is described in the SAMREC Code as follows:

> *"This category is intended to cover situations in which a mineral concentration or occurrence has been identified and limited measurements and sampling have been completed, but in which the data are insufficient to allow the geological or grade continuity to be interpreted with confidence. Due to the uncertainty that may be attached to some Inferred Mineral Resources, it cannot be assumed that all or part of an Inferred Mineral Resource will necessarily be upgraded to an Indicated or Measured Mineral Resource after continued exploration." (SAMREC Working Group, 2009, p. 14)*

An indicated mineral resource is described by the SAMREC Code as follows:

> *"An 'Indicated Mineral Resource' is that part of a Mineral Resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a reasonable level of confidence. It is based on information from exploration, sampling and testing of material gathered from locations such as outcrops, trenches, pits, workings and drill holes. The locations are too widely or inappropriately spaced to confirm geological or grade continuity but are spaced closely enough for continuity to be assumed. The Indicated Mineral Resource has sufficient confidence for mine design, mine planning or economic studies." (SAMREC Working Group, 2009, p. 15)*

Finally, a measured mineral resource is described in the SAMREC Code as:

> *"A 'Measured Mineral Resource' is that part of a Mineral Resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a high level of confidence. It is based on detailed and reliable information from exploration, sampling and testing of material from locations such as outcrops, trenches, pits, workings and drill holes. The locations are spaced closely enough to confirm geological and grade continuity. A Measured Mineral Resource provides sufficient confidence for mine design,*

mine planning, production planning and detailed economic studies to be undertaken." (SAMREC Working Group, 2009, p. 15)

The codes prescribe that only resources which are indicated or measured can be reported as part of a feasibility study (Figure 1). Large portions of the mineral resource may be classified as inferred and only through expensive exploration programmes can they be moved into indicated status. For this reason, it can become expensive to become code compliant.

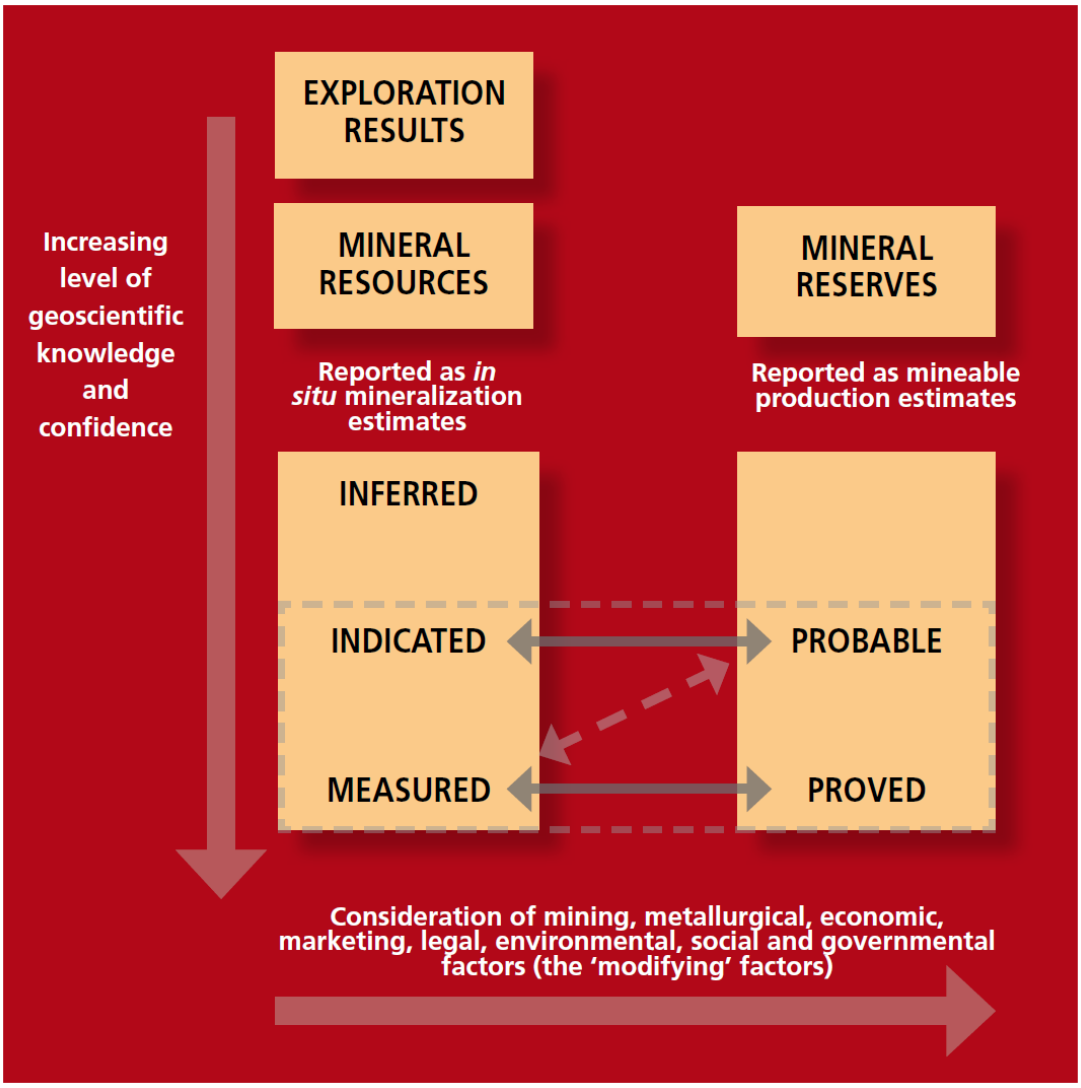

Figure 1 - Classification System for Mineral Resources and Reserves (SAMREC Working Group, 2009, p. 23)

In addition to who will be entering the African mining sector, Porter's "power of the buyers" will play an important role in the future of the mineral industry in

Africa. China is a huge buyer of minerals, see Figure 2 (Pieterse, 2010). In many cases, buyers of the products mined would want a stake in the mining operation to ensure continual supply. If this were the case, they would most likely only purchase a share of the mining company if it was compliant with one of the codes.

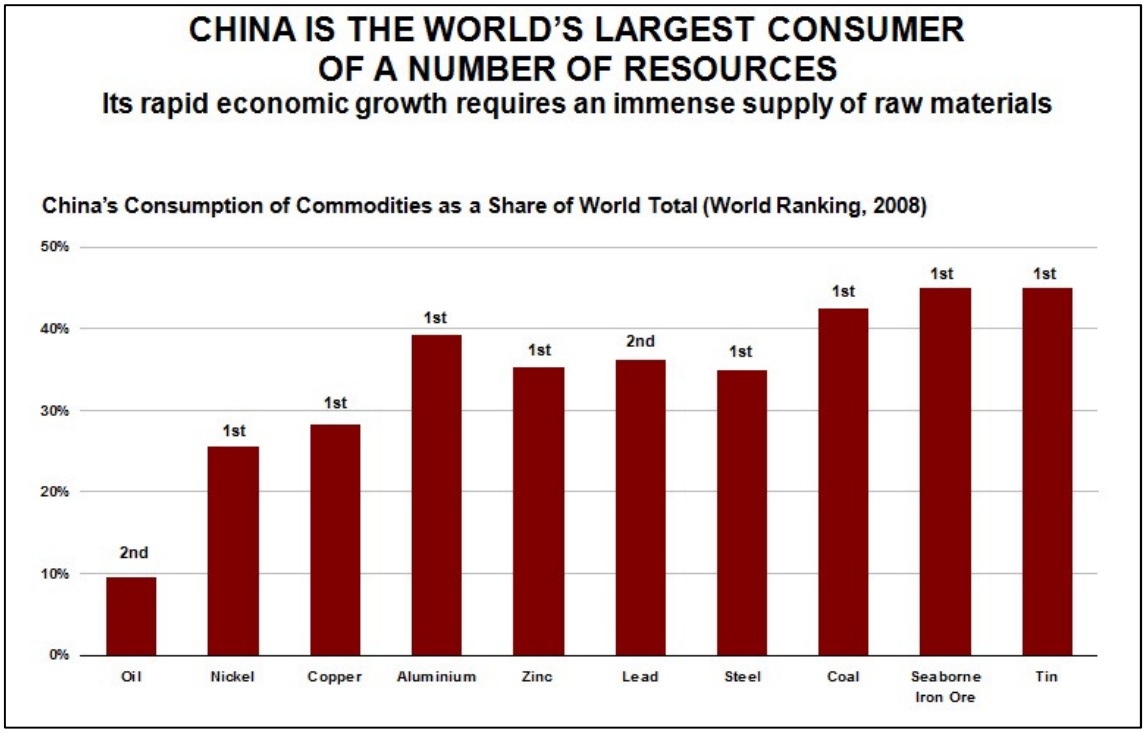

Figure 2 - China's Demand for Mineral Resources (Pieterse, 2010)

The power of the mines, as sellers, is dependent on the rarity of the mineral and the fluctuating mineral prices. By implication, this means that mining companies have very little power as sellers. By means of hedging, mining companies are able to take a view on what they expect the mineral prices will be. This means that they can either forward sell their production (if they forecast a decrease in the price), or if they expect increases in mineral prices, they can take on that risk. Other impacts from the environment such as industrial action can cause ripples in mining companies' abilities to produce a saleable product which in turn can affect the value of the company's shares as well as the sales price of the product. The sales price and economics in turn affect the manner in which the mineral resource is converted to a mineral reserve as described in the SAMREC code (See Figure 1) (SAMREC Working Group, 2009).

Depending on the impact that the SAM-Codes will have on the mineral industry in Africa, the threat from substitutes could be a very real issue. If it becomes too expensive, to comply with the codes, and as the selling price of the mineral in turn becomes expensive, it may be cheaper for customers to switch to a substitute. This could be another mineral or a manufactured product. The threat of substitutes depends on the mineral, for example, thermal coal in coal fired power stations can be substituted by another energy mineral, for example, uranium in nuclear power stations. In many cases, traditional uses for metals are being replaced by plastics; an example is the use of plastic pipes in houses whereas in the past metal pipes were used. In some cases these plastic substitutes are stronger and longer lasting than the metal which they are substituting. Granite can be substituted by wood or synthetic material for table-tops and counter-tops in houses, hotels and restaurants. For these reasons, it is important to consider that the SAM-Codes could force a move to substitute products, if they force mining companies to spend more capital on exploration in order to become code compliant.

It is of interest to the author as to whether the SAM-Codes are likely to promote investment in the African mining industry by ensuring good governance around the reporting of exploration results, mineral resources and mineral reserves, or if they will constrain investment due to their restrictive nature, as discussed above. It is also important to consider that there is a strategic impact of the SAM-Codes on the growth of the mining industry in Africa.

Either way, they have been included as a mandatory requirement in the listing rules of the JSE since 2007 (Le Roux, 2007).

1.3 Problem statement

1.3.1 Main problem

The purpose of this research is to assess the impact of the current SAMREC and SAMVAL reporting codes on the growth of the mining industry in Africa.

1.3.2 Sub-problems

The first sub-problem is whether the South African Mineral Reporting Codes and by association the JSE will inhibit or stimulate growth in the mining industry in Africa. To understand this, the research will attempt to understand if the majority of growth will be through equity raised via the JSE and South Africa as a gateway into Africa, or through investment from foreign stock exchanges with their own codes.

The second sub-problem is to understand whether the authority of the South African codes will be undermined if growth in the African mining industry comes from foreign direct investment thus bypassing the JSE and SAM-Codes. So to understand this, the source of the foreign investment must be understood.

1.4 Significance of the study

The study has filled a gap in the understanding of the impact that the current SAMREC and SAMVAL Codes are having on the growth of the African mining industry. If the sources of capital are from public funding like the JSE or South African investment banks, then the SAM-Codes are prescriptive, whereas if the projects are self-funded or funded by foreign governments and companies, then at best, the codes are merely guidelines. This relationship will be analysed to understand if it is to the detriment or benefit of the African mining industry.

It is also worth noting that the SAM-Codes are not the only mineral resource reporting codes. Depending on the source of funding (country), foreign mineral reporting codes may undermine the SAM-Codes and also have a role to play in the growth of mining in Africa.

In all cases mining companies investing in Africa need to keep their costs down in a highly competitive industry where the timeframe and risk of capital investment can be substantial with the added risk of fluctuating mineral prices (Strongman, 1994). Keeping capital expenditure low is important in an industry where it is not unusual to have capital payback periods of up to half of the life of the project or mine, which could be up to 20 years or more. This capital

payback requirement forces companies to keep their costs low, as high costs with a huge capital payback obligation could cause the mining operation to become unviable and close down. This is a clear pursuit of Porter's (1980) cost leadership strategy. He suggests with this strategy that a company needs to keep their costs as low as possible and to become the lowest cost producers in an industry.

For mining companies to improve the information around their mineral resources to become code compliant, it could cost them huge capital expenditure. So if they are trying to keep costs down, being code compliant could mean that the project is no longer viable.

This study provides guidance to those professionals who are involved with the mining industry. This includes managing directors, senior management, investors, bankers, mining companies, other stakeholders and Africa nations. It sheds light on the impact that the South African mineral codes, as well as the related international mineral codes have on the growth of the mining industry in Africa. Additionally, this study attempts to understand where growth is coming from at the moment and also in the future.

From the outcomes it also informs management what codes are likely to be used in Africa in the future and what is best practice for their organisations when investing in projects on the continent.

1.5 Delimitations of the study

This research project looks at the SAM-Codes specifically. However, as a result of the work that has been done, it is clear that the international codes are also important in the African context. For this reason, it looks at and discusses the international mineral codes rather as competition to the SAM-Codes than as a focus.

The context of this research report focuses only on the African perspective and not the rest of the world.

The study identifies reasons why the use of the current reporting codes are a challenge for corporate governance in terms of mining companies and countries with their own sources of capital. It is essentially only a guideline in these cases instead of a mandatory requirement.

Any governance dealing with investment practices outside the minerals industry falls out of the scope of this research.

This research study will not be including or considering changes in International Financial Reporting Standards.

1.6 Definition of terms

There are several terms, and definitions of these terms, that need to be defined and these will be explained in the following table;

Table 1 - Definition of terms

Term	Description
BRIC	Brazil, Russia, India and China.
Exploration	Exploration is the process of finding ore by means of drilling programmes, geological skills, geophysical skills and techniques (Atlas Copco, 2009).
Exploration Results	Exploration results include data and information generated by exploration programmes that may be of use to investors (SAMREC Working Group, 2009).
In situ	In the original place (Oxford Dictionary, 2013). A rock or mineral resource where it was originally formed or deposited.
JORC Code	Joint Ore Reserves Committee, the Australian mineral reporting code.
Mineral Resource	A Mineral Resource is a concentration of material of economic interest in or on the earth's crust where there are reasonable expectations of economic extraction (SAMREC Working Group, 2009).
Mineral Reserve	Economically viable portion of a mineral resource for mining and extraction (SAMREC Working Group, 2009).
National Instrument 43-101	Canadian mineral resource reporting code
Ore	Commercially viable mineral that has been extracted profitably from the ground.
Reporting Code	A code which sets out minimum standards, recommendations and guidelines for Public Reporting (CRIRSCO, 2013).
SAMREC Code	The South African reporting code for reporting of exploration results, mineral resources and mineral reserves (SAMREC Working Group, 2009).
SAMVAL Code	The SAMVAL Code is a governance code, and it sets out minimum standards and guidelines for Public Reporting of Mineral Asset Valuation (SAMVAL Working Group, 2009).
Waste	Uneconomical material that must be removed from the mine to access the ore .

1.7 Assumptions

Prior to any research having been conducted the following table lists and presents all assumptions and their relevance.

Table 2 - Assumptions and their relevance

Assumption	Relevance
Knowledge of interviewees	It is assumed that business people interviewed understand the SAMREC and SAMVAL Codes.
Understanding of applicability	It is assumed that business people interviewed understand the applicability of the SAMREC and SAMVAL Codes.
Acceptance of the code	It is assumed that there is an acceptance of the SAM-Codes (reporting-codes).
Understanding of the code by business	It is assumed that there is a good understanding of the SAM-Codes by mining organisations, investment houses and the JSE because of their exposure to the mining industry.
Willingness to engage	This research project assumed that mining professionals with an understanding of the SAMREC and SAMVAL Reporting Codes were prepared to engage with the researcher on this topic.
Willingness to be interviewed	A further assumption was that mining professionals were willing to be interviewed.
Number of interviews	It was assumed that there would be enough interviewees available to be interviewed to draw meaningful conclusions.
Quality of the answers	It was assumed that because of the choice of domain experts, the quality of the answers are sufficiently high to draw meaningful conclusions.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Many sources of information were used in the preparation of this literature review. These include peer reviewed journal articles, newspaper articles, books, the mineral reporting codes, mining industry technical literature and conference proceedings. They cover topics on strategy, emerging markets, governance, exploration and mining. Due to the fact that the mineral codes are a relatively recent development, and that most of the work around the codes are done by working groups or committees within regulatory bodies, there are very few peer reviewed academic papers written about them. Rather there are papers discussing the need for corporate governance and the requirements for regulations and industry standards.

The aim of this literature review is to assess:

- whether growth in the mining industry in Africa will be through the JSE, thereby forcing code compliance, or through funding from international stock exchanges with their own codes.
- whether the South African Codes will be undermined if growth in Africa comes from FDI.
- the sources of FDI.

From this, the study then considers the role that the SAMREC and SAMVAL Codes play, and the possible impact that they have on mining related investments and growth in Africa.

2.2 Background

This research paper seeks to understand who the current dominant players are in the mining sector in Africa. Through qualitative research, it assesses who the domain experts predict will be playing a strategic role in the growth of the sector and the impact of the Sam-Codes.

This sets the scene to assist in understanding who will be funding this growth. From that understanding it will be possible, through a series of interviews with domain experts, to appreciate their sentiments on the impact of the mineral reporting codes on growth of the mining industry in Africa, based upon the sources of funding.

2.3 Will the codes stimulate growth?

The first sub-problem is whether the South African Mineral Reporting Codes and by association the JSE will inhibit or stimulate growth in the mining industry in Africa. To understand this, the research will attempt to understand if the majority of growth will be through equity raised via the JSE and South Africa as a gateway into Africa or through foreign stock exchanges with their own codes.

2.3.1 The reason for mineral reporting codes

Corporate governance has become integral in running a business and is a complex topic. This is extremely important in the case of mining companies because they generally look for funding either through stock exchanges, banks or through direct investors. The mineral assets that are initially inaccessible, and for the most part not auditable, need to go through an exploratory phase to supply potential investors with what tonnage (amount) and grade (quality) of mineral potentially exists underground. These projects need to be comparable with each other so a standard set of reporting codes have had to be developed.

As a direct result of a major scandal involving a group of Canadian companies called Bre-X, it became obvious that a reporting code was needed to protect investors in mineral projects (Cawood, 2004). The geologist involved in the exploration of an Indonesian gold deposit salted the exploration samples sent off for analysis with gold purchased from local artisanal miners (Hellman, 2002). After news of the fraud was aired, the value of the company plummeted, from a listing value of C$6 billion to virtually nothing (Cawood, 2004).

The Toronto Stock Exchange launched an investigation into reporting property valuations and introduced their CIM Code for reserve valuation and their

CIMVAL Code, a financial valuation code of practice (Cawood, 2004). If they had released this earlier, as has been done by the Australian Stock Exchange the Bre-X fraud would never have happened (Cawood, 2004).

One of the requirements for listing on global stock exchanges is that mining and exploration companies adhere to the relevant mineral resource reporting codes (SAMREC Working Group, 2009). In South Africa these codes are defined by the SAMREC Working Group (2009) as the minimum standards for public reporting of exploration results, mineral resources and mineral reserves. Depending on the stock exchange that the company is being listed on, there are region specific codes that apply. In Canada there is the Ni 43-101, in Australia the JORC Code is used, in the USA the SME Guidelines are used, Europe uses the PERC Standard and in South Africa there is the SAMREC code (Bourassa, et al., 2003).

In much the same way, the value of un-mined mineral resources needs to be valued to define a mineral asset (SAMVAL Working Group, 2009). A mineral asset is defined by the SAMVAL Working Group as a property that a company has been given the right to explore or mine (or both) (SAMVAL Working Group, 2009). The code, or guideline, that has been proposed and applied in South Africa is the SAMVAL Code. It describes a method of valuating the worth of these mineral resources (SAMVAL Working Group, 2009).

2.3.2 The stock exchanges

The JSE was established as a stock exchange in 1887 (JSE, 2013a). It is a large source of financial information and has moved from a floor based trading market to a fully electronic trading exchange (JSE, 2013d).

The JSE states, as one of its requirements for listing of exploration and mining companies, that mining and exploration companies have a CPR which is compliant with the SAMREC Code (JSE, 2013b). Thus, the JSE prescribes that one of the requirements of listing of mining companies is that they have to be SAMREC compliant. It is worth noting that it also states that the CPR could be compliant with the JORC or Ni43-101 Codes (JSE, 2013b). That automatically

places these two codes in direct competition with the SAMREC Code for South African listings.

Due to the size of the Australian (AIX) and Canadian (TSX) stock exchanges and the number of mining companies listed, they are huge competitors of the JSE. For this reason, as part of this literature review, these two stock exchanges have been researched.

All statistics quoted about the Toronto Stock Exchange (TSX) are as at December 31, 2012. According to the TSX, it is a leader in mining listings with 57% of the world's public mining companies listed on it (TSX, 2013a). The reasons given are its access to capital, liquidity, diverse issuer base, service at all stages of growth and benefits to investors by partnering with a global leader (TSX, 2013a). It is impressive that 70% of all mining equity financing worldwide is done on the TSX (TSX, 2013a). See Figure 3 below.

Of the C$10.3 billion mining equity raised in 2012 on the TSX, C$1.7 billion was raised for mining projects in Africa, which makes it a significant force in Africa and in turn that makes the Ni 43-101 mineral code a fierce competitor of the SAM-Codes (TSX, 2013a). They have 173 listed mining companies in Africa, operating in 36 countries across the continent (TSX, 2013a).

One of the requirements of listing on the TSX is to provide geological and technical reports that are Ni 43-101 compliant (TSX, 2013b).

The AIX has been around for about 150 years, and is one of the leading security exchanges in the world (ASX, 2013b). This is the first exchange to open each day and lists some of the world's largest resource companies (ASX, 2013b).

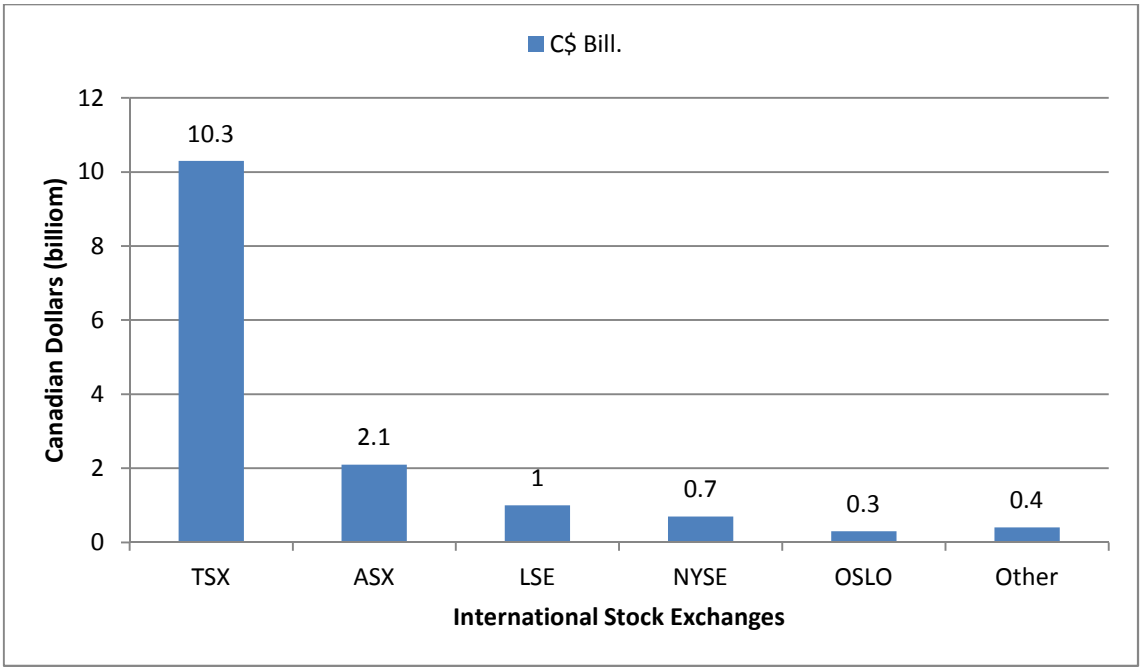

Figure 3 - Global Mining Equity Financing Trend 2012, (TSX, 2013a)

The ASX has 174 listed mining companies in Africa (TSX, 2013a). By contrast, the JSE has less than 40 registered mining companies, of which only a small number have prospects or operations in Africa (JSE, 2013c). Of the largest mining stocks in terms of market capitalisation, diversified miners BHP Billiton and Rio Tinto are listed on the ASX (ASX, 2013b).

One of the mandatory listings requirements for mining companies on the ASX is that these companies provides a JORC compliant mineral reserves report whether for historical results, if applicable, or on newly declared reserves (ASX, 2013a).

Thus it can be seen that the Canadian and Australian stock exchanges are the largest stock exchanges in the mining sector worldwide.

2.3.3 Drive for Africa

There has been a new rush into Africa from the rest of the world (Kahn, 2011a). African mineral wealth is largely unexplored (Strongman, 1994). Kahn (2011a) specifically states that there will be a rush into Africa by the BRIC countries and he says that in 2050 China will be the biggest economy in the world, with India

the third largest and Brazil the seventh largest. He also goes on to say that Russia will be the seventeen largest economy and South Africa will be the thirtieth largest. South Africa is currently the twenty-fourth largest economy, but Kahn (2011a) says the reason for the drop in position is because of the limited size of South Africa's population compared with the four BRIC countries.

Rodrigues (2004) observes that there is a trend in developing countries interested in developing their minerals industry where the governments initially opt for direct participation in the exploitation of their mineral reserves. He goes on to state that there is a global tendency for these developing nations to adopt a policy of regulating the mining sector and allowing the private sector to deal with operational risk.

According to Morisset (1999), one of the principal attractors of investments into African countries is determined by their natural resources and the size of their local markets. At the time that Morisset (1999) wrote his paper, he points out that the reforms of many African countries were not yet complete and they had not convinced foreign investors to develop activities that are dependent on natural resources. He went on to describe a few factors that assist in increasing investments into a country in Africa. He states that establishing a stable macroeconomic environment is one observable factor that seems to enhance investment into a country. Another one that he highlighted is to establish a stable political climate after periods of political instability. Trade liberalisation, privatisation programmes and adoption of international treaties related to FDI also play a part in improving foreign investment (Morisset, 1999).

According to Kahn (2011a), South Africa was the main source of FDI into Africa until 2006, as a result of the reserve bank allowing large outflows of capital into Africa but not the rest of the world. In addition, he states that South Africa was the largest recipient of inward FDI in Africa until that time. At the moment, China is the largest source of FDI into Africa, with a potential increase from the USA (Kahn, 2011a).

He argues that South Africa could act as a

> *"Gateway to Africa" (Kahn, 2011a, p. 494)*

with Brazil to the West (across the Atlantic Ocean), China and India to the East and Russia to the North.

Several important historical occurrences have happened in Africa, including the independence of Angola, allowing Brazil to extend its economic influence across West Africa, China built the Tazara railway from Tanzania to Zambia, Zimbabwe gained its independence, the Berlin Wall collapsed, Namibia gained its independence and South Africa became a democracy (Kahn, 2011a). Furthermore, China opened up to foreign investors, the former Soviet Union opened up to capitalism, Brazil went through economic reforms and India deregulated (Kahn, 2011a). These occurrences all contributed to the expansion of the emerging economies of the BRIC countries (Kahn, 2011a).

Kahn (2011a) feels that Brazil and Africa share similar histories and there are political, geological and ecological similarities. Mining, in terms of diamonds and iron, is a huge source of income for Brazil, just as the mining industry in Africa is economically important for many Africa nations (Kahn, 2011a).

Vale, Brazil's mining conglomerate, is operating in Mozambique, Angola, Gabon, Guinea and Zambia (Kahn, 2011a). However, in spite of the Brazilian move into Africa, Kahn (2011a) believes that South Africa and Brazil have very little chance against the onslaught of India and China's move into Africa.

2.3.4 Growth in the mineral industry in Africa

Historically, the benefits of developing mineral resources in Africa have varied between the communities, governments and the mining companies, but the minerals industry in Africa could play a transformative role for the continent (The International Study Group, 2011). With an increase in demand for minerals worldwide, there has been an rise in competition for the mineral commodities in Africa (The International Study Group, 2011).

There is increasing interest in investing in the African mining industry and a rising demand for Africa's minerals from Asian countries, which is an opportunity for the formation of developmental agreements in infrastructure and related

industries (The International Study Group, 2011). As the level of investment in the minerals industry increases, so too does the requirement for good governance and transparency (The International Study Group, 2011). In a sense, this is where the mineral reporting codes will play an important role.

Historically, large areas of Africa were unexplored and there was very little mineral resource information available. In addition, there was a lack of capital, skills and technology to develop known mineral deposits (The International Study Group, 2011). Only a limited number of minerals, strategically important to developed nations, were mined by multinational companies and thus not significantly contributing towards the development of the country's economy (The International Study Group, 2011).

It is worth noting that the hidden costs of mining, for example ecological damage and potential ground water contamination, are some of the realities that face African countries when allowing foreign companies and countries to exploit mineral resources (Pedro, 2013). These costs offset the economical benefits received from the foreign investors and as such decrease the overall benefits the county receives.

In his article in the Financial Mail, Cranston (2011b) notes that prior to the global financial crisis of 2008, most investors would be looking at accepted safe havens like the US and European bonds market. However now they would be looking at other investment destinations. He goes on to say that the BRIC countries are looking expensive from an investment perspective while Africa holds many opportunities for quick witted investors.

Table 3 shows the world's fastest growing economies in terms of annual average GDP growth (%) in the period 2001 to 2010, as well as their expected growth for the years 2011 to 2015. In the period 2001 to 2010 five out of the ten fastest growing economies were from the African continent (highlighted in blue) and six out of ten are expected to be from Africa in the period 2011 to 2015. While this growth was not solely as a result of the minerals industry in these respective countries, a significant portion of the growth was from that sector.

Table 3 - World's Ten Fastest Growing Economies, Annual Average GDP Growth (%)

Country	Growth 2001-2010	Country	Expected Growth 2011-2015
Angola	11.1	China	9.5
China	10.5	India	8.2
Myanmar	10.3	Ethiopia	8.1
Nigeria	8.9	Mozambique	7.7
Ethiopia	8.4	Tanzania	7.2
Kazakhstan	8.2	Vietnam	7.2
Chad	7.9	Congo	7.0
Mozambique	7.9	Ghana	7.0
Cambodia	7.7	Zambia	6.9
Rwanda	7.6	Nigeria	6.8

Source : Financial Mail, October 7, 2011 (Cranston, 2011b)

In a related article Cranston (2011a) interviewed South African fund managers regarding investment into Africa. In one of these interviews, Stanlib Africa's fund manager John Makie felt that due to the constant threat of nationalisation in the mining industry in Africa that it was a risky investment. In contrast, the co-manager of Coronation's Africa funds, Peter Townsend said, in a similar interview, that he felt that if a project was given the worst possible risk you would have a 100% upside potential. Investec's Roelof Horne felt that due to the risk associated with fluctuating mineral prices, he would prefer to invest in businesses that leveraged off of Africa's unique economic fundamentals rather than in the minerals industry.

So it can be seen from above that there are various sentiments from the South African investment firms both optimistic and cautious in terms of investing into African mining companies. This is to be expected depending on the risk profiles and portfolio composition of these various funds.

2.3.5 The South African Codes' contribution to growth

As we have seen from the research above, the mineral reporting codes are of utmost importance in ensuring corporate governance. In addition, it can be argued that they are essential in protecting investors against misleading or incorrect mineral resource reporting. The SAM-Codes are effective in this sense.

The research indicates that it has become a listing requirement of the stock exchanges of the world for mining and exploration companies to be compliant with the approved mineral reporting code for that exchange. This is once again to protect the investors. The JSE recognises the Ni 43-101, the JORC as well as the SAM-Codes for listing (JSE, 2013b). The TSX is the stock exchange with the largest mineral resource listing in the world, and there are numerous companies listed there that are operating in Africa (TSX, 2013a). It is the same with the ASX. Many ASX listed companies are operating in Africa (ASX, 2015). The research suggests that compared to the five largest international stock exchanges there are very few mining and exploration companies listed on the JSE that are operating out of South Africa.

We see from the research that there seems to be a drive by the BRIC countries into Africa, suggesting that there is no requirement for mineral reporting code compliance if the source of funding is not from public sources. The literature suggests that there is an increasing investment into Africa since the global financial crisis rather than into the US and European markets.

All of this implies that the SAM-Codes are important in South Africa, but there are bigger players influencing growth in Africa.

2.3.6 Research Question 1

The codes are prescriptive when companies want to list on the JSE, yet they are only considered to be a guideline, if at all necessary, when mining companies are not seeking funding from public sources.

Will the growth in the mining industry in Africa be through equity raised via the JSE and South Africa as a gateway into Africa, or through investment from foreign stock exchanges with their own codes?

2.4 Will the SAM-codes undermine growth?

The second sub-problem is to understand whether the authority of the South African codes will be undermined if growth in the African mining industry comes from foreign direct investment thus bypassing the JSE and SAM-Codes. So to understand this, the source of the foreign investment must be understood.

2.4.1 Introduction

It is likely that most of the investment in Africa will be from foreign investment (Broadman, 2008).

2.4.2 The impact of the BRICs

The first time the term BRIC was used was in an article by an analyst working for Goldman Sachs, and the first time that these four countries met and agreed to work together as the BRICs was in 2009 (Petropoulos, 2013). The BRIC countries, also known as emerging market economies, are going through a massive growth surge (Kahn, 2011a). As a direct result of this growth surge they need to source resources to fuel this growth surge. In addition, their growth has given them an increase in economic strength, as well as an expansion in political influence (Phat, 2012). These BRIC countries have the largest populations in the world, and are the second largest economies after the USA (Phat, 2012). For the most part, they have a trade surplus, and are therefore a force to be reckoned with (Phat, 2012).

The BRIC countries have large populations with low standards of living, and therefore have access to low cost labour, enabling them to become the factories of the world for various products like electronics, clothing and equipment (Phat, 2012). Yet it is not all good as most of the poor in the world today live in the

BRIC countries, and the associated problems like crime, illiteracy and exploitation of women and children are rife (Phat, 2012).

The BRIC countries have helped raise the value of previously undervalued African assets by means of FDI (Africa Confidential, 2010). The investment by the BRICs has increased from US$10 billion a year during the period 1994 to 2003, to US$121 billion by 2008 (Africa Confidential, 2010). Due to urbanisation and the increase in the manufacturing sector in the BRIC countries, there has been an increase in demand for African resources, in particular coal, copper, iron ore, oil, manganese, as well as others (Africa Confidential, 2010).

2.4.3 Brazil's investment into Africa

Vale is Brazil's largest diversified mining company, it is the second largest mining company in the world and it has a number of assets in Africa (Baxter, 2011). These assets are located in Gabon, Angola, Guinea, Liberia, Malawi, Mozambique, The Democratic Republic of Congo, South Africa and Zambia (Naidoo, 2012). Vale's procurement director stated that Africa will always be an important site for investment outside of Brazil (Naidoo, 2012). Naidoo (2012) also reported that at the time of writing the article for S.A. Mining magazine that Vale intended investing US$7.7 billion into Africa over several years. He quoted one of Vale's directors, Paulo Couto as stating that Africa was one of the last places on earth to explore for minerals and that there is a great deal of interest for investment in the continent by the rest of the world.

In addition to Vale, Brazilian president Lula and his government have implemented a foreign policy towards Africa which means direct foreign investment in African prospects (de Freitas Barbosa, et al., 2009).

Figure 4 below shows the countries in Africa in which Brazilian companies are invested.

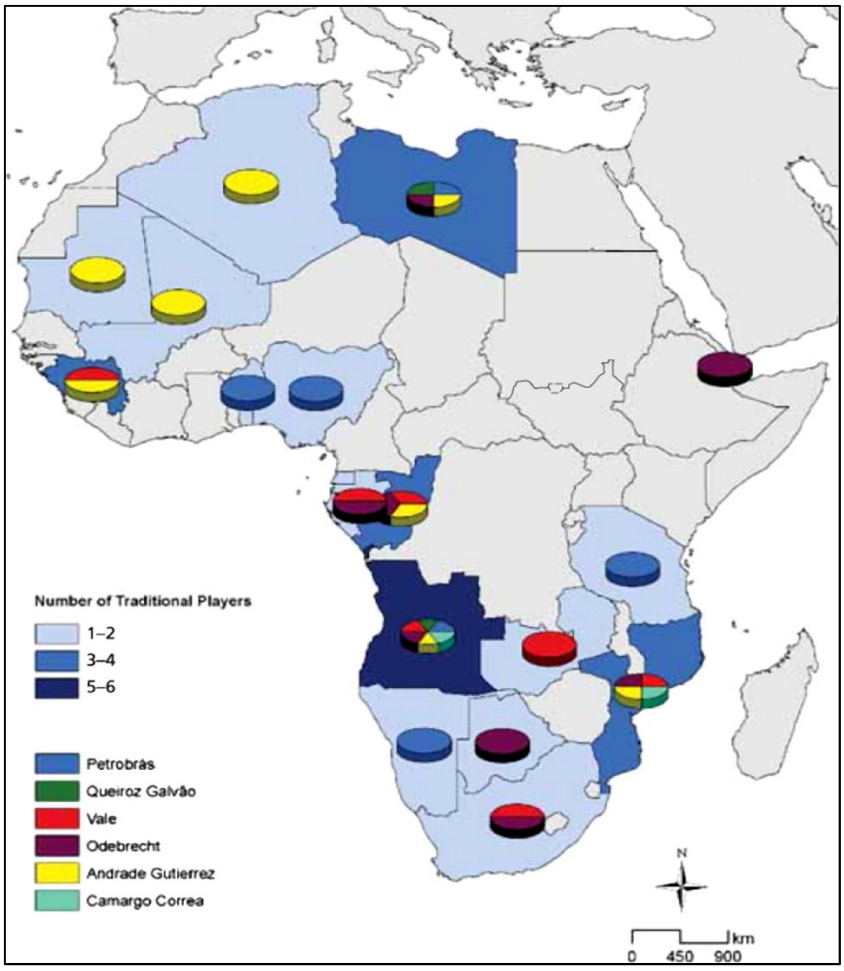

Figure 4 - Brazilian Companies in Africa (Carrillo, et al., 2011)

2.4.4 Russia's investment into Africa

Russia has always had historical links with Africa and is now interested in Africa's mineral wealth (Crown Publications, 2013).

Russian companies like Norilsk Nickel, which owns 50% of Nkomati Nickel in South Africa and has an operation in Botswana called Tati Nickel, are investing in Africa (Crown Publications, 2013). The Russian company called ENRC has a non-ferrous division in Africa, and owns 12.2% of Northam Platinum (Crown Publications, 2013). Another Russia mining company, Renova, has US$250 million worth of mining assets in South Africa (Crown Publications, 2013).

Russia has indicated that it is interested in developing mining operations in Africa in cobalt, chromium, diamonds and platinum (Crown Publications, 2013).

2.4.5 India's investment into Africa

Trade between Africa and India has been active since the days of the silk trade and current trade and investment channels are increasing in scale (Broadman, 2008). Most of this trade with India is with African countries that have mineral resources and oil deposits, but it is starting to include such things as consumer goods and household items (Broadman, 2008).

All of this is good news for the African continent as trade with Europe and the USA has been limited historically, and this should provide opportunities for the continent to grow (Broadman, 2008).

Unfortunately with the good comes the bad. In some countries the investing companies are displacing similar African companies in local markets and are not creating many job opportunities for locals (Broadman, 2008).

In addition to China, India is also investing in the African continent and Shaw, Cooper and Antkiewicz (2007) postulate that these two Asian giants will largely shape the 21st century global economy. Right now the amount of trade and foreign investment between Africa and India is high (Broadman, 2008). Sixty-eight percent of all trade between Africa and India is with South Africa, which comprises minerals, precious stones, metals and alloys (Broadman, 2008).

2.4.6 China's investment into Africa

Over the last decade there has been an increase in the amount of FDI into Africa, especially from China (Strauss & Saavedra, 2009). China is now the largest source of FDI into Africa, its second largest trading partner and an avid consumer of minerals and land (Kahn, 2011b). (Gedye, 2011) stated that the largest investments by China into Africa have been in the energy, transport and metals industries. Tull (2006) believes that China's return to Africa could be one of the most significant developments for the continent in the future. In 2010

93% of Africa's trade with China was metals, minerals and petroleum products (Gedye, 2011).

In an article by Hornby (2009) it is stated that Chinese investors in Africa have been receiving low-interest state loans. She explains that projects in Africa are negotiated with the Chinese government's help, and loans to fund these projects have been obtained from state-owned banks that support the Chinese government's policy objectives.

Since the global financial crisis in 2008 there has been a trend where emerging markets, especially China, have looked at alternate sources of mineral resources to fuel their growth and have injected FDI into underdeveloped yet resource rich African countries (Edinger & Pistorius, 2011). As a result of China's demand for resources there has been an increase in mineral prices and it has resulted in an increase in growth in Sub-Saharan Africa (Edinger & Pistorius, 2011).

In a paper by Bazika(2009) on China and the Republic of Congo's relations, he points out that the latter has an abundance of oil and forest resources and that China requires natural resources for its growth. Congo and China have been engaged in trade since 1964 and this relationship has resulted in social and economic benefits for Congo (Bazika, 2009). He then goes on to say that China subsidised the establishment of The National Bureau of Commerce in Congo.

The two countries' trade has increased since early in the 2000 decade and now Congo's main client for its oil is China (Bazika, 2009) .

Trade between these two countries is assisted by China's trade policy, where raw material exports from African countries are not charged customs duty and have very low tariffs (Bazika, 2009). The reason behind these policies is to ensure the supply of mineral and energy resources for China (Bazika, 2009).

China uses approximately 30% of the global aluminium production, 40% of the global iron ore production and more than 50% of the global oil production (Edinger & Pistorius, 2011). The USA is the top consumer of oil in the world, whereas China is the second largest consumer.

2.4.7 South Africa's trade with Africa

South African mining giants like Anglo American, De Beers and Goldfields, have been investing in the African mining sector for a number of years (Anglo American, 2010), (Goldfields, 2010). As per the annual report, Anglo American currently has assets in Africa thanks to their shareholding in De Beers.

De Beers has operations in South Africa, Botswana and Namibia and has profitable working partnerships with the governments of these neighbouring countries (Anglo American, 2010). There is ongoing exploration in these countries for diamonds and the relationship is likely to continue at least for the life of the existing mines (Anglo American, 2010). Goldfields has massive gold mining operations in Ghana, and there is a remarkable future all along the gold coast in and around Ghana (Goldfields, 2010).

It can be seen from Figure 5 below that Anglo American sees China as both a huge threat as a producer of minerals, as well as a massive client with huge potential in the future.

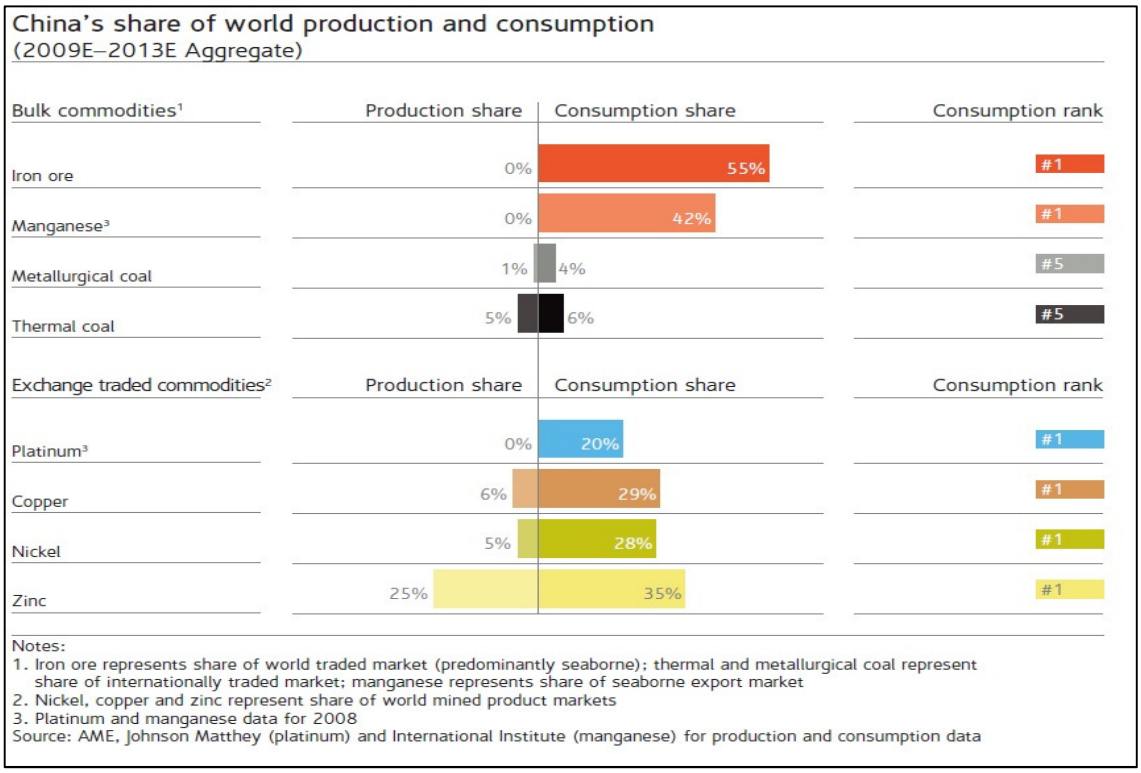

Figure 5 - China's Share of World Production and Consumption (Anglo American, 2010)

Having said all of this, it is worth noting that mineral prices are cyclic and go from booming high prices to lows, periodically (Edinger & Pistorius, 2011). This may present problems to African countries heavily reliant on their mineral wealth for foreign income.

2.4.8 European Union's trade with Africa

The trade between the European Union (EU) and Africa is decreasing due to the length and complexity of trade negotiation, as well as the pro-UN nature of the outcomes of the final agreements (Cheru & Obi, 2011). The EU wishes to gain back its position as the main trader with Africa, and it sees China and India's influence, both political and economically as a threat (Cheru & Obi, 2011).

2.4.9 The United States of America and Africa

The United States of America (USA) is mainly invested in Africa where it sources oil for its energy requirements, and it is concerned about competing with the East for those reserves (Cheru & Obi, 2011). The extent that China is aggressively increasing its trade for oil with African countries is at a greater rate than the USA, which is a concern for the USA in terms of its strategic oil requirements going forward (Cheru & Obi, 2011).

2.4.10 Where will the source of funding of mining projects in Africa come from ?

A conclusion that can be drawn from the research is that there will be investment in the African Continent in the future, with a large focus on its essentially untapped and vast mineral resources. So growth is expected, but how will the mineral reporting codes impact it ?

In addition to the literature review above, research interviews have been conducted to identify who the future investors and the sources of their funding will be in Africa.

2.4.11 Research Question 2

A conclusion that can be drawn from the literature study is that there is interest in investing into the African Continent in the future, with a large focus on its essentially untapped and vast mineral resources. So growth is possible, but how will the South Africa mineral reporting codes and the JSE impact on it ?

Will the authority of the SAM-Codes be undermined if growth in the African mining industry comes from FDI thus bypassing the JSE and the SAM-Codes?

2.5 Conclusion of Literature Review

From the literature review it can be postulated that there are many players interested in mining in Africa. It is important for the economic upliftment of the continent that it is seen that strategic growth of the mining industry in Africa is a viable option.

The codes are prescriptive when companies want to list on the JSE, yet they are considered to be only a guideline when mining companies are not seeking funding from public sources. The same can be said for the international codes. If international listings are used as a source of funding then they would need to be compliant with the relevant international mineral codes, yet if funding is not sourced from public sources it would not necessarily need to be code compliant.

2.5.1 Research Question 1:

Will growth in the African mining industry be through JSE listings with South Africa being the gateway into Africa and the SAM-Codes having relevance or will investment come from foreign stock exchanges with their own codes?

2.5.2 Research Question 2:

Will the authority of the SAM-Codes be undermined if growth in the African mining industry comes from FDI thus bypassing the JSE and the SAM-Codes? To understand this, the source of the foreign investment must be understood.

CHAPTER 3: RESEARCH METHODOLOGY

This section of the research report outlines the method of research that was applied to address the proposals and research questions put forward in the literature review.

Thereafter the research design and the research instrument that has been used will be discussed. A description of how the information obtained with the research instrument used in this study has been analysed and is provided.

The population and how it was sampled for this study will be discussed and the makeup of that selection will be explained.

A description of the data analysis and the interpretation of the results is discussed in this chapter, which leads to the list of recommendations and conclusions at the end of the study.

Then finally the limitations of the study are considered, including a discussion on the validity of the research and reliability of the results of this study.

3.1 Research methodology

This chapter is about research, so to begin with this term needs to be defined. Research is:

> *"...the notion of inquiring into, or investigating something in a systematic manner." (Merriam, 2009, p. 3)*

There are three main research methods available to researchers, quantitative, qualitative and mixed methods approaches (Creswell, 2003).

The quantitative approach is associated with true experiments, correlations, surveys and many variables (Creswell, 2003). These have been around since the 19th century and rely on statistical analysis to interpret the results (Creswell, 2003). The qualitative approach is concerned with how people interpret what they observe and experience and it tries to uncover the meaning of the

phenomenon to those encountering it (Merriam, 2009). The mixed methods approach collects and analyses both quantitative data as well as qualitative data in a single study to produce a result that is better than each on its own (Creswell, 2003).

For this research report a phenomenological qualitative method has been used to answer the research problems. This method was chosen because it allows the researcher to identify the experiences of people regarding a phenomenon (Creswell, 2003). In the case of this report, it is to understand the phenomenon of subject matter experts' experience regarding the impact the SAM-Codes have on the growth of the mining industry in Africa. This experience and the opinions of the experts cannot be measured in any quantifiable fashion, and so the qualitative approach was selected.

Merriam (2009) states that there are four main characteristics that most researchers identify as qualitative research:

- Process, understanding and meaning are the central focus.
- The researcher is the main mechanism of data collection and analysis.
- Process is inductive.
- Product is highly descriptive.

Qualitative researchers collect data, construct theories and perform interviews to build towards the final product rather than testing hypotheses as in quantitative research (Merriam, 2009).

According to Merriam (2009), all qualitative research is to a certain extent phenomenological. However that branch that deals with people's experiences and how they interpret them is the type of research dealt with in this study, applying it to the perceptions of the impact the mineral codes will have on the mining sector in Africa.

Mining companies would not disclose their growth strategies via survey questionnaires or other indirect methods as their intellectual property is what gives them their competitive advantage. For this reason, it is necessary that the research methodology employed is qualitative and face-to-face research

interviews will be used. As a result of the lack of any other adequate methodology, this method will assist in yielding better quality data (Wu, 1967).

3.2 Research Design

The research framework comprises the purpose of the study as described in section 1.1 above and the problem statement as described in section 1.3 above (Merriam, 2009). To assist in developing this research framework further, a literature review was conducted in Chapter Two to develop the theoretical construct around the problem statement.

Based upon this work and the previous section (3.1), the research methodology is to perform research interviews with professionals in the mining industry.

For this research a schedule of at least ten (10) to a maximum of fifteen (15) interviews with acknowledged mining industry professionals were targeted. This was done to understand the perceptions of experienced mining professionals on the growth strategies in the African mining arena, and the impact that the SAMREC and SAMVAL Codes have on sources of funding.

The research interview is defined by Wu(1967) as a pattern of verbal interactions between the interviewer and the interviewee(s) on a research study to gather specific data and test hypotheses.

This type of research design is best suited for this research study as it is difficult to measure numerically the perceptions of mining professional with regards to the underpinning drivers of growth in the mining industry and the role the SAM-Codes will play.

The advantages of this type of research as it pertains to this study are as follows (some adapted from Creswell (2003)):

- Interviews were done at the offices of the participants and in their own environments.
- The researcher is the primary instrument in the collection of the data as opposed to a research mechanism.
- Focus is on the process that is happening as well as the outcome.
- Unlike surveys, once a participant has agreed to the interview the data is guaranteed.

The disadvantages of this type of research as it pertains to this study are as follows (some adapted from Creswell (2003));

- Data from qualitative studies are descriptive, primarily the participants words
- Data is based on participants' perceptions
- Reliant on intuitive and felt knowledge rather than cold facts
- Objectivity and truthfulness of participants is required
- Reliance on a recording device to capture interviews is a risk if the device fails
- Transcription of recorded interviews is a tedious process

3.3 Population and sample

3.3.1 Population

The population that was used for the purposes of the research study is the mining industry. More specifically, it is the mining professionals who perform management or consultancy services to the mining industry across Africa. The individuals that were targeted for the interviews were either involved with the writing of the SAM-Codes or produce reports that are compliant with these codes.

3.3.2 Sample and sampling method

Due to the limited accessibility by the author to mining professionals across Africa, the sample selected is from a network of professionals in South Africa. While this may bias the outcomes, the author believes that the results will be scalable into the mining sector in Africa, as all of the individuals interviewed and the companies they work for are actively working with mining projects in Africa.

This form of sampling is non probability sampling. According to Merriam (2009) probability sampling allows the researcher to make generalisations from results. However, generalisations are not in a statistical sense the aim of qualitative research, nor is it justifiable in qualitative research Therefore, in qualitative research non probabilistic sampling is the method which must be used (Merriam, 2009). The most common form of non probabilistic sampling is purposeful sampling, where the researcher selects a sample of experts specifically for their experience and competence (Merriam, 2009).

The research aimed to interview ten to fifteen professionals associated with the mining industry or until convergence was achieved. These industry experts were selected from a group of professionals within the network of the author and his colleagues at the South African Institute of Mining and Metallurgy. This number was chosen to ensure that it was guaranteed that at least ten to twelve respondents would accept.

Table 4 - Profile of Interviewees

Description of respondent type	Number to be sampled
Managing Directors / Vice Presidents / Partners	5
Senior Managers	2
Domain Experts / Mining Consultants	6
Investment Analysts	2

3.4 The research instrument

In qualitative research interviews are always used to either collect all of the data or at least some of it (Merriam, 2009). An interview can be defined as follows;

> *"...a process in which a researcher and a participant engage in a conversation focused on questions related to a research study"* (DeMarrias, 2004, p. 55)

The instrument that will be used for this research report will be a semi-structured research interview instrument. A semi-structured interview is defined by Merriam(2009) as having questions that are more flexible and that the questions will vary slightly as the respondent goes about answering the questions, but with specific information being sort after. A specific set of open ended questions have been prepared and used. These questions have been asked in a specific order so as to have the data collected in a comparable form. In spite of the seemingly rigid intent, the actual interviews were conducted in a flexible fashion sometimes introducing elements of latter questions in the earlier ones, or prompting the participant when straying off topic. Specific information is required from the participants and this is why specific questions and their order makes up the interview process.

The questions that will be asked will consist of leading questions, supportive questions and exploratory questions.

A leading question is a principal question which is key to the questions asked in the research (Wu, 1967). He defines a supportive question as a question that could be essential yet could be omitted if the data is obtained from a leading question. In addition, he describes an exploratory question as a question that is used to identify new variables and to devise new propositions.

Seven main questions were formulated, of which three are leading question with three exploratory questions and one supportive questions. However within each of the main questions supportive questions were used to guide the interview towards specific goals.

Most of the interviews were conducted in half an hour. This was intentional so that the proposed interviewees would not refuse to be interviewed due to time constraints. This was achieved by ensuring that each question took on average four and a half minutes to answer and with no note taking this was a sufficiently managed time schedule for data collection.

3.5 Procedure for data collection

According to Merriam (2009) the most commonly used method of data collection in interviews is by means of an electronic voice recording device. She also stated that there are two drawbacks to this method. Firstly, the possibility of malfunction of the equipment and secondly, participant's uneasiness with being recorded.

For this study the data has been recorded via a digital recording device and transcribed after each interview. This meant that an audio and text copy of the interviews was available at the end of the study. This also means that future analysis could be performed on the recorded data if necessary.

There were no malfunctions of the equipment yet a few of the respondents expressed unease at being recorded. They were assured that all responses would be treated as anonymous and their identities would remain confidential.

The procedure for data collection began with a telephone call to the potential respondent to discuss the topic and requesting their participation. This was followed up by an email providing more detail of what the research was about including the research topic and the two sub-problems. Interview appointments were set up and confirmed.

At the interview, the respondent’s permission was requested to record the interview and then once again the topic was explained with a description of the intended goal. After the interview, the respondent was thanked for their participation and a follow up email was sent.

All interviews were transcribed verbatim by the author.

3.6 Data analysis and interpretation

As a result of the fairly structured nature of the questions, the answers were compared and common themes have been identified. The analysis of these has resulted in a list of recommendations that are presented at the end of the study in section 6.3.

Segments of the transcript data that answers the research questions have been identified (Merriam, 2009). From these common themes were identified. These common themes were coded, a method of identifying specific portions of the data, should they be words, sentences or even paragraphs, so that they can be easily retrieved (Merriam, 2009). The bits of information must be heuristic and be the smallest piece of data that can support itself (Merriam, 2009). These were then subdivided into categories, the data was analysed and this was used to support the findings, recommendations and conclusions for this study.

3.7 Limitations of the study

Below are the limitations of this study that have been identified;

- The interviews have been primarily conducted with mining professionals in Southern Africa in spite of the study focusing on Africa.
- The sample may be biased towards a Southern African perspective, but the author is confident that because the individuals selected for interviews are currently working on projects and engaged with mining companies working in Africa, that their comments are topical and well informed.
- Research interviews do not produce quantitative data for comparison and measurement of one interview against another. However the methodology of the research instrument should circumvent this point.
- Individual bias could swing the outcome of the study.

3.8 Validity and reliability

Research has to be both valid and reliable (Merriam, 2009). It also needs to be produced in an ethical fashion (Merriam, 2009). This is so that it can be used in applied fields and that the practitioners can be comforted with the knowledge that the results are demonstrable and repeatable (Merriam, 2009). This will now be addressed for this research.

3.8.1 External validity or transferability

External validity is being able to take what has been observed in a study and to then generalise that information into the larger population (Kalof, et al., 2008). In the case of qualitative research Merriam (2009) argues that external validity and generalisation should not be associated with this kind of research and that one should rather look at the transferability of the research to another setting. This will be the approach that is taken in this section.

She goes on to say that to ensure transferability, it is important to provide a description of the data, the participants and the setting (where appropriate). That is the philosophy that was used when the data and findings were presented in Chapters Four and Five.

The largest variation in the sample of the participants will also allow for better transferability (Merriam, 2009). This method was applied to gain a good amount of transferability for this study.

Finally, the sample was selected so that a typical example of a respondent was chosen as per Merriam (2009), who states that if it is the case then the study is transferable. So in this sample they are all professional individuals with degrees in mining or geology, they all have exposure to mining in several African countries, they all work with the SAM-Codes on a daily basis and they all have broad mining sector strategic knowledge. For these reasons the author believes that the study is transferable.

3.8.2 Internal validity

Internal validity is about drawing appropriate conclusions from the results and observations recorded and obtained from the study (Kalof, et al., 2008).

By means of cross referencing what has been learned from the literature review with what was discussed in the interview sessions, and ensuring that for the most part the questions are the same for each interview, internal validity will be maintained.

Internal validity will be retained by ensuring that the questions asked during the interviews are answering the research question (Kalof, et al., 2008).

In addition, respondents selected are all of high professional integrity and members of professional bodies. The need for accurate and honest responses was stressed at the start of the interview to ensure that the internal validity was maintained.

3.8.3 Reliability

Reliability is mainly concerned with consistency (repeatability) and credibility of the results (Kalof, et al., 2008). They go on to say that research results are considered reliable if they can be duplicated in repeated applications of the research.

Wu(1967) notes that one mistake which is critical to reliability of data in research interview methodologies is how the interview is recorded. He states that there are four generally accepted methods that are used:

- Note-taking by the interviewer.
- Writing up after the interview.
- Note taker sitting in on the interview.
- Recording.

According to Wu(1967), note-taking by the interviewer or by a third party note-taker distracts from the interview, and writing up the interview afterwards means

that the transcript will never contain the richness of data or level of accuracy that the original interview had in it.

The interviews conducted for this research report were recorded digitally and transcribed after the interview.

In addition, the researcher was the only person who performed the interview, and the only person to transcribe them. As indicated above the research instrument was the same for all of the respondents and essentially the same information was extracted from the respondents. If a similar study is performed in a similar way, because of the sample taken and the research instrument used it will result in the same findings i.e. repeatable and reliable.

CHAPTER 4: PRESENTATION OF RESULTS

A qualitative research methodology was used to collect data to answer the posed research question. The research instrument used was structured interviews, where each respondent was asked the same set of questions in the same order. There were instances where the author was required to further explain the question or prompt for the relevance of the respondent's answer to the SAM-Codes as opposed to the other international mineral codes in use.

The first two interviews were the pilot interviews and although the same questions were used in the interviews that followed, they were subtly reordered to flow from broad overarching questions to more specific questions. Even though it is unconventional, these respondents will form part of this research report as one of them has been involved with the SAM-Codes as part of the SAMVAL committee. The other respondent is involved with writing industry focused reports that are SAMREC compliant on a daily basis, and has experience with the other international mineral codes in use.

4.1 Introduction

A qualitative research methodology was undertaken to collect data answering the posed research question. The research instrument that was used was an interview schedule with managing directors, senior managers, domain experts, and mining consultants. A series of seven questions were compiled as a part of the structured interviews, with the focus on being open ended thus not prompting yes or no answers (See appendix A).

Due to the sensitive nature of the study, all interviews were granted and done on the understanding that the interviewees' identities would be kept confidential. Some of the interviewees expressed concerns regarding the recording of the interviews and on being quoted as having made controversial comments. For this reason, the transcripts of the actual interviews have not been attached to this report, but are available for review, if required.

Respondents have been allocated a number so that where necessary their comments can be compared with those of others.

4.2 Demographic profile of respondents

It was intended that a sample of ten to fifteen respondents were to be interviewed or until convergence was reached. After interview six it became clear that convergence was happening and at interview twelve it was decided that sufficient convergence had been achieved. At that point two of the respondents, which brought the total respondents contacted to fourteen, had not replied to repeated attempts to contact them, and this was taken as an unwillingness to participate in the research study. Therefore twelve of the fourteen respondents targeted and contacted agreed to being interviewed, which means a total of 85.7% of the professionals approached agreed to participate in the research study.

As described in Section 3.3.2 above, the sample was taken from a selected group of domain experts and mining industry consultants in the Southern African region. All of the people interviewed had as a minimum a mining, engineering or earth science degree, with one having a doctorate level qualification and several others having post graduate qualifications.

The interviewees are all based in the Gauteng province, but frequently travel to various countries on the African continent in their capacities as mining professionals. All of the interviewees except one work as consultants to the mining industry across Africa. The interviewees consisted of managing directors / vice presidents, senior managers, domain experts and mining consultants.

4.3 Results pertaining to Research Question 1

4.3.1 Research Question 1

Research question 1 is whether the South African Mineral Reporting Codes and by association the JSE will inhibit or stimulate growth in the mining industry in Africa. To understand this, the research attempts to understand if the majority of growth will be through equity raised via the JSE and South Africa as a gateway into Africa, or through investment from foreign stock exchanges with their own codes.

4.3.2 Results - Research Question 1

Refer to section 2.3 which forms part of the Literature Review in which reference is made to the research question 1.

Research instrument questions 1, 2, 4 and 6 were posed to the respondents to gain an understanding of where the majority of the growth in the mining industry in Africa will come from. Either South Africa and the JSE, and as such enforcing the SAM-Codes, or foreign stock exchanges with their own codes. See Table 5 for a summary of the interview results.

Table 5 - Results of Research Question 1

	Research Question 1: Will the codes inhibit or stimulate growth in the mining industry in Africa?												
Respondents	**Q1a: Is Africa becoming a source of mineral resources?**		**Q1b: Will Codes assist with this?**		**Q2: Is RSA's JSE a gateway to Africa or will funding come from direct FDI?**		**Q4: What will the SAM-Code's impact be on growth in Africa ?**			**Q6a: Would historical mines in SA have opened had the codes existed then?**		**Q6b: Are the Sam-Codes inhibiting growth?**	
No.	**Yes**	**No**	**Yes**	**No**	**JSE**	**FDI**	**Increase**	**Decrease**	**None**	**Yes**	**No**	**Yes**	**No**
1	✓			✓		✓			✓		✓	✓	
2	✓			✓		✓			✓		✓		✓
3	✓			✓		✓			✓	✓	✓		✓
4		✓		✓		✓	✓				✓		✓
5				✓		✓			✓	✓			✓
6	✓			✓		✓			✓	✓			✓
7	✓			✓		✓			✓	✓	✓		✓
8	✓			✓		✓			✓	✓		✓	
9	✓			✓	✓				✓		✓	✓	
10	✓			✓		✓			✓	✓			✓
11	✓			✓		✓	✓			✓			✓
12	✓					✓			✓		✓	✓	

4.3.2.1 Presentation of interview data - Question 1

Due to political risk the African continent has been largely untapped in terms of its mineral resources and a resource hungry world is turning its attention to Africa. Is this statement valid and how is this going to impact Africa moving forward ? Will the Codes assist or deter ?

Research instrument Question 1 was an attempt to understand whether Africa is becoming a source of the raw resources for the world's economies and how the codes and the JSE will contribute to this.

It compares what Kahn (2011a), Morisset (1999) and Strongman (1994) predicted as discussed in section 2.3.3 of the literature study with what the respondents' views are today.

The respondents' answers to this question were almost unanimous. They felt that Africa is becoming a huge source of the mineral requirements of the developing countries, as well as the western world. They felt that investment into Africa is being extensively explored and that there are vast opportunities in terms of the mineral wealth of Africa. Respondent Four felt that most of the easily accessible and high value mineral resources have already been mined out and that what remains will require application of scientific techniques to access the minerals economically. Respondent Five did not answer this question because of his enthusiasm around the codes in general, and diverted his discussion to that of the history of the codes instead.

All of the respondents except Respondent Twelve felt that the SAM-Codes would not necessary assist with Africa becoming a source of mineral wealth for the world. Respondent Twelve did not answer this aspect of Question One during the interview, and that was only noted upon transcribing the recording.

4.3.2.2 Presentation of interview data - Question 2

Do you see the JSE and South Africa as a gateway into Africa or do you believe that investment will be through foreign investments?

Research instrument question 2 is to understand whether investment into Africa will be through South Africa, being a stable economy on the continent, and by means of JSE listings forcing companies to comply with the SAM-Codes. If this is not the case and foreign investment comes from sources that are not forced to be code compliant, then the SAM-Codes become powerless.

Section 2.3.2 of the literature study discusses the listing requirements of the JSE and the need to be compliant with SAM-Codes, Ni 43-101 or JORC.

Kahn (2011a) sees South Africa as a gateway to Africa and this question addresses what the current sentiments are in the sample interviewed. See section 2.3.3.

South Africa and specifically Gauteng is the home of the JSE. It is a stable economy with a good climate, good infrastructure and first world health facilities. In addition, it has exceptional cell phone infrastructure and IT technology which all make it an ideal place to establish a base of operations for access into Africa.

However, eleven Respondents out of the twelve felt that growth in Africa would not be through the JSE and South Africa as a gateway into Africa. One respondent, Respondent Nine, said that growth could possibly occur through the JSE. He believes that the creation of the Alt-X would allow junior mining companies to list on the JSE.

4.3.2.3 Presentation of interview data - Question 4

What impact do you think the current SAMREC and SAMVAL Codes will have on the growth of the mining industry in Africa ?

This question is core to the thesis and having moved from the broader discussions in questions one and two, this one specifically asks the question of

the impact the codes will have on growth. Its purpose is to try to understand what the feeling is in the industry with regards to the SAM-Codes in growth in Africa.

Section 2.3.4 of the literature study points out that there is a demand for the mineral resources of Africa.

Ten out of twelve respondents stated that the SAM-Codes would not have any impact on growth in Africa. The observations by these respondents were that the JORC and Ni 43-101 Codes are taking over market share from the SAM-Codes. The two Respondents who felt that there would be growth as a result of the codes said that the codes would standardise mineral resource and reserve reporting and that without compliance there would be no investment into mining projects.

4.3.2.4 Presentation of interview data - Question 6

<u>There has been speculation that some of the historical mines in Africa would never have been opened had the codes existed then.</u>

<u>Could the codes actually inhibit growth because they are too strict, or would they merely result in foreign companies / foreign governments investing in the African mining industry directly?</u>

This question tries to gain insight into why many successful, extremely high value historical mines were opened with very little information regarding their mineral resources. The level of exploration information on these mineral resources would not have been code compliant. To get them code compliant, more arduous and extremely costly exploration programmes and feasibility studies would have had to be run. These studies might have prevented the mines from ever opening and could have inhibited growth.

Respondents One, Two, Four, Seven, Nine and Twelve felt that these mines which were opened with very little, non-compliant information historically, would not have been opened today.

Respondents Five, Six, Eight, Ten and Eleven said that they believed that more exploration and work would have been done to bring these mineral resources up to being compliant with the codes. Their opinion is that these mines would then have been opened. Respondents three and seven stated that they believed that the mines would not have been opened, but that more work would have been done. So while they initially responded no, they ultimately responded positively with a caveat.

Respondents One, Two and Eight felt that many of these mines were self-funded by the large mining houses and therefore would not have needed to be funded from other sources.

Respondent One, Eight, Nine and Twelve felt that the codes were inhibiting growth. They felt that so much capital is required to get to the level of compliance to approach banks and list on stock exchanges that the codes become inhibiting.

Respondents Two, Three, Four, Five, Six, Seven, Ten and Eleven felt that the codes were not restrictive and therefore not inhibiting growth.

4.3.3 Conclusion - Research Question 1

It can be said that in the opinion of the experts interviewed, the SAM-Codes will neither stimulate nor inhibit growth in Africa as the majority of growth will be through foreign investment and not through the JSE or South Africa as a gateway into Africa.

The respondents were divided on whether historical mines would have been opened if the codes were around then, yet most felt that the codes are not inhibiting growth.

4.4 Results pertaining to Research Question 2

4.4.1 Research Question 2

The second sub-problem is to understand whether the authority of the South African codes will be undermined if growth in the African mining industry comes from FDI thus bypassing the JSE and the SAM-Codes. So to understand this, the source of the foreign investment must be understood.

4.4.2 Results - Research Question 2

Refer to section 2.4 which forms part of the Literature Review in which reference is made to the research question 2.

Research instrument questions 3, 5 and 7 were posed to the respondents to gain an understanding of where they believed the source of foreign investment would come from.

See Table 6 for a summary of the results.

Table 6 - Results of Research Question 2

	Research Question 2: Will the SAM-Codes be undermined by international mineral codes if growth comes from FDI?									
Respondents	**Q3: Where will growth in the mining industry in Africa come from?**					**Q5: SAMREC and SAMVAL codes aside, do you believe that in cases where there are foreign direct investment bypassing the JSE, that other codes would be relevant ? if so, which ones?**				**Q7: Any further insights that Respondents felt could add to research project.**
No.	**Brazil**	**Russia**	**India**	**China**	**Other**	**Other codes relevant**	**JORC**	**Ni 43-101**	**Depends on source**	
1	✓		✓	✓	✓	✓	✓	✓		**See comments in text below.**
2			✓	✓		✓			✓	**See comments in text below.**
3	✓	✓	✓	✓		✓			✓	**See comments in text below.**
4			✓	✓		✓	✓	✓		**See comments in text below.**
5						✓		✓		**See comments in text below.**
6			✓	✓	✓	✓		✓		**See comments in text below.**
7			✓	✓		✓	✓			**See comments in text below.**
8				✓		✓	✓			**See comments in text below.**
9			✓			✓	✓			**See comments in text below.**
10		✓	✓	✓		✓	✓	✓		**See comments in text below.**
11	✓		✓	✓		✓	✓	✓		**See comments in text below.**
12				✓		✓	✓			**See comments in text below.**

4.4.2.1 Presentation of interview data - Question 3

In your opinion, where do you think the growth of the mining industry in Africa will come from ?

Do you believe that a significant amount of investment will come from China, India, Brazil and Russia, i.e. the BRIC countries ?

The purpose of this question is to understand where the growth in the mining industry in Africa will come from, especially in terms of the developing economies of the BRIC countries.

Section 2.4 in the literature study discusses the possible sources of investment to assist growth in the mining industry in Africa.

Respondent One, Three and Eleven felt that there would be investment from South America, and that it would mainly be from Brazil.

Only Respondents Three and Ten felt that there would be some investment from Russia.

Nine of the respondents felt that there would be large amounts of investment from India.

Ten out of the twelve respondents felt that there already are and that there will be significant amounts of investment into Africa by China as a result of the growth of that country.

Two of the respondents felt that there would be investment from countries other than those mentioned above.

4.4.2.2 Presentation of interview data - Question 5

SAMREC and SAMVAL codes aside, do you believe that in cases where there are foreign direct investment bypassing the JSE, that other codes would be relevant ? If so, which and why ?

The reason for this question is to understand the relevance of other mineral reporting codes and if they will undermine the SAM-Codes.

Two of the respondents felt that it depends on the source of FDI as to which codes would be relevant.

Six of the respondents felt that the Canadian Ni 43-101 would be the code that would be used for funding, while eight respondents felt that the Australian JORC code would be the code used.

All twelve respondents either by directly stating so, or by inference, indicated that they believed that because of the source of funding that the foreign codes are more relevant than the SAM-Codes in Africa, as very little funding is coming from the South African market.

4.4.2.3 Presentation of interview data - Question 7

Do you have any insights into this matter that you believe could contribute to this study?

This question was used to extract any related personal views that the respondents did not express because of the structured questions. This question was asked with the hope of gaining greater insight into the matter of the SAM-Codes and growth of the mining industry in Africa.

Respondents One and Two felt that China is investing in Africa and that there will be a great deal of growth from that country. In addition, Respondent One felt that India too would invest and aid growth.

Four of the respondents felt that all of the codes were offering protection to investors, which in turn means that the amount of investment into Africa should increase.

One respondent felt that there were synergies between the codes and accounting practices which could lead to how mineral resources are reported on the balance sheets of companies.

One respondent felt that the convergence of the codes will happen possibly leading to a single international mineral code.

4.4.3 Conclusion - Research Question 2

There was a strong indication from the respondents that the growth in the African mining sector would mainly come from China and India, with some interest from Russia and Brazil.

In addition, a trend emerged that the international mineral reporting codes would undermine the South African codes when FDI funding was the source of investment in Africa.

4.5 Summary of the results

The respondents felt that the SAM-Codes will neither stimulate nor inhibit growth in Africa as the majority of growth will be through FDI and not through the JSE or South Africa as a gateway into Africa.

The majority of respondents indicated that sources of FDI will likely be from China and India, and to a lesser degree from Brazil and Russia. As a result, the SAMREC and SAMVAL Codes will not greatly impact growth in the mining industry in Africa.

CHAPTER 5: DISCUSSION OF THE RESULTS

5.1 Introduction

In this chapter the results presented in Chapter Four will be discussed and explained. Firstly, the demographical profile of the various respondents will be presented. Next, the results of the research instrument will be analysed. These results will be presented in the same order that they were discussed in Chapter Four. Finally, the conclusions will be presented.

5.2 Demographic profile of respondents

The demographics of the group selected for the interviews were selected with the research in mind. It was of utmost importance that the group understands and uses the SAMREC and SAMVAL Codes as part of their professional career. It would be useless interviewing an individual who merely knew that the codes existed but was unfamiliar with their contents and their application. In addition, it was important that the individuals were willing to participate in the study. A negative or disinterested respondent would not contribute willingly or positively to a study such as this. In fact, they would hinder the study by skewing the results and the findings.

A further key to this study is that the respondents work in the African arena rather than limited to the South African context. This was a concern at the beginning of the study. The question that was raised was that unless the interviews were conducted across Africa, how representative would the study be. For that reason, the respondents interviewed have very impressive resumés with experience across the African continent. The respondents are consultants either working in their private capacity as consultants or as part of mining and geological consulting firms.

It was hoped that at least one respondent would be an investment analyst, but no response was received from the two contacts who were approached.

In addition, a few members of the SAMREC or SAMVAL committees were interviewed, but it was decided that the sample could not consist of more than a few members of that group to prevent bias. A representative mix was chosen, with members of the industry who use the codes as well as members of these committees involved with their creation.

In consideration of the initial intentions of selecting the respondents, Table 7 lists the demographics and whether the aim was achieved.

Table 7 - Demographical profile of respondents

Category	Level
Managing Directors / Vice Presidents / Partners	Very good representation
Senior Managers	Very good representation
Domain Experts / Mining / Geology	Very good representation
Investment Analysts	Poor representation
Overall Assessment	Representative sample

5.3 The presentation of the results of Research Question 1

5.3.1 Research Question 1

Research question 1 is whether the South African Mineral Reporting Codes and by association the JSE will inhibit or stimulate growth in the mining industry in Africa. To understand this, the research attempts to understand if the majority of growth will be through equity raised via the JSE and South Africa as a gateway into Africa, or through investment from foreign stock exchanges with their own codes.

5.3.2 The outcomes for Research Question 1

5.3.2.1 Africa: Source of mineral resources

From Research Question One during the interviews with the respondents it was fairly clear that they felt that Africa is becoming a source of mineral resources for the world. In this sense the literature study and the interviews have yielded the same response.

The literature study looked at various papers that discussed the fact that there is interest in Africa's mineral wealth. Kahn (2011a) states that there will be a rush into Africa. He specifically says that this interest will come from the BRIC countries. He also points out that China is the largest source of investment into Africa.

Strongman (1994) states that Africa's mineral wealth is largely untapped and Morisset (1999) says that Africa's natural resources are one of the main attractors of investment into the continent.

It seems clear from this that Africa is very much a source of the mineral resources of the world as both the respondents and the literature states this.

5.3.2.2 Mineral codes assisting growth

While the respondents felt that Africa will be the source of mineral resources of the world, they did not feel that the SAM-Codes would assist with this.

There were no academic papers that the author found indicating that the SAM-Codes were likely to assist with Africa being a source of the minerals for the world.

Therefore the outcome is that the SAM-Codes will not be likely to assist Africa to become the source of minerals for the world.

5.3.2.3 JSE, a gateway into Africa or FDI

From the interviews, all but one respondent felt that the JSE and South Africa would not be a gateway into Africa. They felt that investment into Africa would be via FDI and not through the JSE. One respondent pointed out that it would not make sense for investors to list on the JSE and be liable for South African taxation as well as being taxed in the country where mining is taking place.

In the literature research, Kahn (2011a) felt that South Africa is the gateway into Africa. He felt that especially China and the rest of the BRIC countries would be investing into Africa but he argues it will be through South Africa.

There is a conflict in what the research predicted and what the respondents felt. However, it makes sense that the investors would rather invest directly into the project in the relevant country, than list on the JSE.

5.3.2.4 Sam-Codes' impact on growth in Africa

As to whether the SAM-Codes would impact on growth in the mining industry in Africa, ten of the twelve respondents felt that there would be no impact on growth by the South African codes. They did indicate that because the codes protect investors, the international codes, which seem to be popular with the companies investing in Africa, could impact on growth in the region.

The literature study did not find any academic papers, articles or other indications that disagreed with what the respondents said. There were several

indications that the international codes would provide corporate governance and protection of investors.

So from this it can be concluded that the SAM-Codes are not impacting on the growth of mining, but there is an indication that the international codes are. There seems to be a sense of comfort for investors from the codes.

5.3.2.5 SAM-Codes inhibiting growth

The question of the codes inhibiting growth was considered, and the matter of whether really successful mines that were opened and operated in the past would have been opened today with the codes being around. This was asked in the context of the successful gold and diamond mines in South Africa, some of which were opened with very little information and at an inferred level of confidence. These mines would not be SAMREC compliant by today's standards.

As to whether these mines would have been opened provoked mixed reactions from the respondents. Five of them saying no, and five of them saying yes. The two remaining respondents said yes and no. These two respondents said that because many of these mines were not SAMREC compliant they would not have opened. However they felt that more exploration would have been done to make them compliant. These respondents can be grouped with those that said that these mines would have been opened because their reason was also that more exploration would have been done to make them SAMREC compliant.

The respondents were then asked if they believed that the SAM-Codes are inhibiting growth. A slight change was found when asking this question, compared with the question asked above. This time only four felt that they are inhibiting growth and eight felt that they were not affecting growth. This means that three of the respondents gave a different view to this question compared with the question about preventing the opening of historical mines, which implies that they are not inhibiting.

From the literature study it was noted that the JSE would not allow a listing of mining or exploration companies unless it had a CPR that reported the mineral resources are in fact code compliant. It also found that no formal source of funding whether that be from stock exchanges or the banking sector would be given if the mining or exploration companies did not provide a code compliant CPR. This could be argued to be inhibiting. However, C$10.3 billion was raised on the Toronto Stock Exchange in 2012 while it insists on Ni 43-101 compliance for any mining or exploration companies' listings. So surely, drawing from the Canadian example, the codes in general are not inhibiting growth. This logic can be transferred to the SAM-Codes, as they are comparable with the Canadian, Ni 41-101 Code.

The evidence in the literature study, show large amounts of capital being raised on the Canadian Stock exchange with its relevant code. This combined with the majority of respondents stating that they believed that the SAM-Codes were not inhibiting growth, draws the conclusion that the SAM-Codes are not inhibiting growth in the mining industry.

5.3.2.6 Conclusion for Research Question 1

Africa is and will be a source of mineral resources for the world, but the SAM-Codes will not assist this process. Although there is a conflict in what the research indicated compared with the respondents' statements, the author believes that the respondents' opinion that the JSE is not the gateway into Africa, but that FDI will be directly into the countries where the investments exists, is more realistic. The SAM-Codes are neither impacting nor inhibiting growth in the African Mining Industry, but the international codes are, because they are providing investors with a sense of comfort.

5.4 The presentation of the results of Research Question 2

5.4.1 Research Question 2

The second sub-problem is to understand whether the authority of the South African codes will be undermined if growth in the African mining industry comes from FDI thus bypassing the JSE and the SAM-Codes. So to understand this, the source of the foreign investment must be understood.

5.4.1 The outcomes for Research Question 2

5.4.1.1 The source of growth in Africa's mining industry

From the research interviews, the majority of the respondents felt that the most of the growth in the mining industry in Africa would come from China and India, with some impact from Brazil, Russia and other countries. This means that the developing nations, the BRIC countries, would be impacting growth in the mining industry on the African continent, according to the respondents.

From the literature study it was evident that the BRIC countries are developing rapidly and that they require resources to assist this growth. It is clear from this study that they are sourcing mineral resources from the African continent.

It was shown that Vale, Brazil's largest diversified mining company, the second largest mining company in the world, had mineral resource assets across Africa. One of the directors of Vale has indicated that Africa is one of the last places on earth to explore for minerals. Coupled with this, the Brazilian government has implemented a foreign policy to invest in Africa.

In the literature study it was shown that Russia has always had an interest in Africa mineral wealth and that they intend developing mining operations in cobalt, chromium, diamonds and platinum in Africa.

As shown in the literature study, India has always had a trading relationship with Africa, mostly with the minerals and oil industry. It was shown that India and China will shape the global economy in the 21st century.

The literature study shows that China is the largest source of FDI into Africa and this is focused on minerals and land. The Chinese government is assisting in the investment into Africa in alignment with its policy objectives. This combined with China's trade policy, has seen enormous growth in trade with Africa.

From the evidence presented in the literature study and discussed above, combined with the views of the respondents, it is concluded that the source of FDI and growth in the mining industry in Africa will come from the BRIC countries. It is also concluded that the majority of this growth will be as a result of investment and trade with India and China.

5.4.1.2 Impact of the international codes and effect on the SAM-Codes

The respondents unanimously felt that if the sources of investments into Africa are from FDI and international stock exchanges and not through the JSE, the international codes would undermine the SAM-Codes. Eight of the respondents felt that the JORC Code would undermine the SAM-Codes, six indicated that they believed that the Ni 43-101 code would undermine the SAM-Codes and two felt that it would depend on the source of funding, but also felt that the foreign codes would undermine the SAM-Codes.

From the part of the literature study covered for Research Question 1, it shows that most of the funding for mining raised on stock exchanges comes from the Toronto and Australian stock exchanges. It was also shown in the literature study that if a mining or resource company lists on these two exchanges that they have to have a CPR showing that the mineral resource is compliant with either the Ni 43-101 or the JORC Codes, respectively, thus undermining the SAM-Codes.

There is enough collaboration between the respondents' feedback and the literature study to state that if investment is through an international stock exchange that the international codes would undermine the SAM-Codes. The two codes most likely to undermine the SAM-Codes are the Ni 43-101 and the JORC Codes.

5.4.1.3 Other factors

In the final question the respondents were asked if they had any insights into the topic and if they wanted to add to it.

One issue that they emphasised was the impact of China and India's investments in the growth of Africa's mining industry. This was reflected in the literature study and discussed above.

Another key point that was raised was that the codes are protecting investors and that should increase interest and growth. Again this was raised in the discussion above and also in the literature study.

The synergies between the codes and accounting practice was discussed. This was not something covered by the literature study, and is possibly a topic for a future research report. See Section 6.4.

Convergence of the codes is a topic that was highlighted, with the potential of having a single code relevant to all international stock exchanges. Again, this was beyond the scope of this study, but could be the topic of a research report in the future. See Section 6.4.

5.4.1.4 Conclusion - Research Question 2

In conclusion, investment in Africa is coming from two sources, FDI from BRIC countries, predominantly India and China, as well funding raised on the foreign stock exchanges, mostly from the Canadian and Australian stock exchanges.

In the first case the SAM-Codes would not be relevant and in the second case the SAM-Codes would be undermined by the Ni 43-101 and JORC Codes.

5.5 Conclusion

Africa is and will be a source of mineral resources for the world, but the SAM-Codes will not assist this process. The JSE is not the gateway into Africa, as FDI will be directly into the countries where the investment opportunities exist. The SAM-Codes are neither impacting nor stimulating growth in the mining industry in Africa. However, the international codes are stimulating growth because they are providing investors with a sense of comfort.

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CHAPTER 6: : CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This research report is concluded with this chapter. It will bring together the conclusions made in preceding chapters, to summarise and collate the findings in a final conclusion.

The conclusions will be followed by recommendations that the author believes may be relevant.

At the end of this chapter there will be a section on suggestions for further research.

6.2 Conclusions of the study

It is clear from the literature review as well as from the opinions of the sample of domain experts interviewed, that Africa is one of the last places on our planet that is left with an abundance of minerals and untapped resources. It therefore has been concluded that it is and will be a source of global mineral resources.

The challenges of the South African mineral reporting codes are that they are only really relevant in the South African context. This is a finding from both the literature review and the interviews that were conducted with domain experts. It is therefore concluded that they will not assist or deter Africa supplying the rest of the world with mineral resources.

The literature study suggested that South Africa, through the JSE, would be the gateway into Africa. The respondents, however, felt that South Africa was not a gateway into Africa. They felt that when investing in a mine that was not in South Africa, investors would invest directly into the country where the mineral resource was. The respondents felt that while Gauteng would be a good place to have a local presence for mining companies due to first world infrastructure

and a malaria free environment, it did not make sense that foreign investors would go through the JSE with the additional costs and added company tax that would be incurred. It was therefore, concluded that South Africa is not a gateway into Africa.

In the larger African context, there is no reason why the SAM-Codes would be used to raise capital to fund mining operations, unless the company is listed on the JSE or attempting to secure a loan from a South African investment bank. Even given this, they could still be substituted by the international codes. This is essentially the sentiment expressed by the respondents. It has therefore been concluded that the SAM-Codes are not impacting growth in the mining industry in Africa.

The question of whether the SAM-Codes are inhibiting growth has been considered. This was considered by asking whether mines that were opened in the past with information considered to be noncompliant with the SAM-Codes, would be opened today. The sentiment from the respondents was that more work would have been done to make these mines compliant. From the literature study it was noted that all stock exchanges require these codes, and stock exchanges like the Canadian stock exchange has 173 listings of mining companies in 2012. The conclusion therefore drawn from the Canadian example and the respondents is that the codes are not inhibiting growth and that historically the mines would have been opened after sufficient work was done to ensure that they were compliant.

Through this study, it has been concluded that there would be two sources of investment and growth into Africa, one through FDI by the developing nations of the BRIC countries, and secondly by companies listed on foreign stock exchanges. The largest portion of investment from the BRIC nations would be from China and India. It was also concluded that most of the investment through foreign stock exchanges would come from Canada and Australia, because of the sheer magnitude of capital raised through these stock exchanges. It has therefore been concluded that where growth is through the BRIC countries the SAM-Codes would not be relevant, and where investment and growth is through international stock exchanges, the SAM-Codes would be

undermined by international codes like the Ni 43-101 in Canada and JORC in Australia.

From the above conclusions we can now answer the research questions.

Research question 1 is whether the South African Mineral Reporting Codes and by association the JSE will inhibit or stimulate growth in the mining industry in Africa. It asks whether the majority of growth will be through equity raised via the JSE and South Africa as a gateway into Africa, or through foreign stock exchanges with their own codes.

A very small amount of investment comes from the JSE, rather most investment will come from FDI and international stock exchanges, so the codes will neither inhibit nor stimulate growth in the mining industry in Africa.

Research question 2 is to understand whether the authority of the South African codes will be undermined if growth in the African mining industry comes from FDI thus bypassing the JSE and SAM-Codes.

Growth in the mining industry in Africa will be from two sources, through FDI from the BRIC countries, predominantly from China and India, and from investment through international stock exchanges, mainly from Canada and Australia. This means that the SAM-Codes will not be relevant when investment and growth is through FDI, and they will be undermined by international codes when investment and growth is through international stock exchanges.

From these answers we can answer the main problem as stated in 1.3.1.

"The purpose of this research is to assess the impact of the current SAMREC and SAMVAL reporting codes on the growth of the mining industry in Africa."

The SAM-Codes will have very little impact, if any, on the growth of the minerals industry in Africa. Where investment and growth comes from the international stock exchanges, the foreign codes will impact growth, but if investment comes from FDI then the codes will have little or no impact.

6.3 Recommendations

The following are recommendations made to the stakeholders that were identified in Chapter One, section 1.4.

6.3.1 Business

After the Bre-X fiasco it was realised that a regulatory system needed to be implemented to ensure that mineral resource reporting followed a specific guideline regardless of the mineral type or the country that the mineral resource was situated in.

The Australians started work on the JORC Code and the Canadians started on the Ni 43-101. These codes were meant to regulate mining and exploration companies in terms of their reporting on mineral resources and reserves. They were designed to ensure that mining and exploration companies adhere to specific rules when reporting on their mineral assets.

With this in mind the following recommendations arise from this research for businesses, involved in mining and exploration, to consider.

Currently, Africa is a source of mineral resources and it will be more so in the future. It is recommended that companies ensure code compliance as it is key to mitigating risk during purchases, acquisitions and mergers. It is also recommended that companies ensure that their employees familiarise themselves with the codes. This is important as it can play an important role in the decision making process.

The codes which apply depend upon the source of funding, be that from FDI or international stock exchanges. If funding is from FDI, then it is recommended that the sources of the funding ensure that the mineral resources or reserves that are being invested in, are code compliant in order to protect their investment. The main reason is if the resources or reserves are traded in the future, the potential buyer would want to be assured that the asset is in fact, code compliant, thus code compliance ensures the resell value of the initial investment.

If the funding is from public sources, like stock exchanges, then there will be a mandatory requirement for listed companies, or companies wanting to list, to be code compliant. The same would be applicable if the source of funding is a loan from an investment bank, which would require a CPR and code compliance before supplying funding. Once again it is recommended that mining and exploratory companies considering listing or requiring funding from investment banks ensure that they are compliant in the relevant codes. Code compliance will aid in obtaining loans as the codes provides the investment banks with assurance that resources and reserves are actually available.

Going forward it will be difficult to continue doing business if companies do not ensure that mineral resources are compliant with a specific mineral resource reporting code. The reason behind this statement is that it would be difficult to sell these mineral resources, as buyers and investors would require assurance that the mineral resources are correctly valuated and in fact, compliant. This is again why code compliance is recommended.

The author recommends that African nations enforce mining and explorations companies to ensure that the mineral resources and reserves that they own, or have mining or exploration rights in, are taken to a level at which point they are considered to be compliant with one of the codes. Whether this is because of stock exchange listings or for good corporate governance, as this will afford a certain level of certainty and knowledge around the mineral resources of a particular country, ensuring sustainability. Additionally, it will allow them to ensure show that they are not being exploited

The SAM-Codes, and in a similar respect the foreign codes, refer to a CPR authored by a "competent person" to ensure code compliance. This person needs to have worked in the mining industry, with a specific commodity, for a given period of time, depending on the specific code. It is highly recommended that mining and exploration companies ensure that they have a competent person with sufficient experience in their mineral resources, or that they enlist a suitably qualified consulting company with a suitable competent person employed.

6.3.2 Managing directors, senior management and companies

Managing directors, senior management and companies should note that the SAM-Codes and the international mineral codes are there to protect the interests of the investors, owners and other stakeholders of mineral exploration and mining companies. They form part of good governance.

It is recommended that management of mining and resource companies ensure that they are compliant with the codes that are relevant to their source of revenue. By doing so the companies should, in principle, be able to procure funding. It will also more easily facilitate trading of mineral resources if they are code compliant.

6.3.3 Investors

Investors must realise that the codes have been put in place to protect them from unscrupulous mining companies and unsound investments.

It is recommended that investors in the mining industry should ensure that the mineral resources that they are providing funding for are in fact code compliant. If the investment is into a project that is not listed on a stock exchange and therefore not protected they should ensure that the project is code compliant and at the right level of compliance. This would ensure their peace of mind and provide assurance for reselling of the mineral asset.

6.3.4 The sources of FDI

The sources of FDI need to be aware that they are not protected by the rules and regulations associated with stock exchanges.

It is recommended that if the sources of FDI are investing into mining projects then they need to either ensure that the mineral resources associated with the projects are code compliant or else they need to do their own due diligence to ensure that what they are buying into is indeed what is being reported.

6.3.5 Stakeholders and African nations

Similarly, the nations of Africa with mineral resources have potential for economic growth through FDI and funding from formal sources.

It is recommended that these nations ensure that the mining and exploration companies adhere to one of the mineral codes and that they practice good corporate governance. This would assist in avoiding exploitation and ease the minds of potential investors.

6.3.6 A single international code

It would be beneficial to the mining and exploration industries if there is one mineral code that is accepted worldwide and on all stock exchanges. This would means that mineral resources across the world can be compared directly with each other.

It is therefore recommended that a single mineral reporting and a single valuation code is developed and applied worldwide, much like the IFRS accounting system.

6.4 Suggestions for further research

Future research suggestions are as follow:

- Researching the impact of China's investment into Africa on the growth of the African mining industry. This is because it has emerged from this research study that China is a huge source of investment into Africa.
- Research the convergence of the Mineral Reporting Codes and Accounting Practices. During both the literature study and the interviews there were suggestions that indicated that there should be convergence in the future.
- Research the convergence of the mineral codes into one international code. There is a international body, The Committee for Mineral Reserves International Reporting Standards (CRIRSCO) that is

responsible for assisting with the development of the various codes, like the SAM-Codes. Surely they should consider combining the codes into one code.

- Research the growth of other industries in Africa as a result of the BRIC countries investing in Africa. It was noted during this study that the BRIC countries are looking at Africa to fuel their growth. They are starting to trade in other markets rather than in traditional raw materials and resources.

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APPENDIX A

The Research Instrument

Question 1

Due to political risk the African continent has been largely untapped in terms of its mineral resources and a resource hungry world is now turning its attention to Africa.

Is this statement valid and how is this going to impact Africa moving forward? Will the codes assist or deter?

Question 2

Do you see the JSE and South Africa as a gateway into Africa or do you believe that investment will be through foreign direct investment?

Question 3

In your opinion, where do you think the growth of the mining industry in Africa will come from?

Do you believe that a significant amount of investment will come from China, India, Brazil and Russia, i.e. the BRIC countries?

Question 4

What impact do you think the current SAMREC and SAMVAL Codes will have on the growth of the mining industry in Africa?

Question 5

SAMREC and SAMVAL Codes aside, do you believe that in cases where there is foreign direct investment bypassing the JSE that other codes would be relevant ? If so, which and why?

Question 6

There has been speculation that some of the historical mines in Africa would never have been opened had the codes existed then.

Could the codes actually inhibit growth because they are too strict, or would they merely result in foreign companies / foreign governments investing in the African mining industry directly?

Question 7

Do you have any insights into this matter that you believe could contribute to this study?