KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

KNUST SCHOOL OF BUSINESS

COMMODITY PRICE VOLATILITY RISK MANAGEMENT IN THE MINING INDUSTRY OF GHANA: A CASE STUDY OF ANGLOGOLD ASHANTI, OBUASI MINE (GHANA)

BY

SALAM AYISHETU

A Thesis submitted to the Department of Accounting and Finance, Kwame Nkrumah University of Science and Technology in partial fulfillment of the requirements for the degree of

MASTER OF BUSINESS ADMINISTRATION (FINANCE)

OCTOBER, 2015

DECLARATION

I hereby declare that this submission is my own work towards the MBA and that to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for award of any other degree of the university, except where due acknowledgements have been made in the text.

Name	…….	……
Salam Ayishetu	Signature	Date

Certified by:

Prof. J.M Frimpong	…….	……
(Supervisor)	Signature	Date

Certified by:

Prof. J.M Frimpong	…….	……
(HOD Accounting and Finance)	Signature	Date

DEDICATION

This work is dedicated to Abdul Rahman, Es-Hal and Alhaji, the wonderful family.

ACKNOWLEDGEMENT

I wish express my profound gratitude to KNUST School of Business for the nurturing and guidance in the graduate programme of the Executive Masters in Business Administration. It is an opportunity I will cherish forever.

I am also grateful to Prof. Frimpong, my supervisor whose counsel and direction has been very valuable. I thank all my friends, family and colleagues for your countless contribution throughout the course.

ABSTRACT

Mining is a high risk activity and the success of a mining company such as AngloGold Ashanti, Obuasi Mine is a function of many and varied factors that range from the gold price to the suite of laws and regulations governing its business, from labour disruptions to environmental concerns and from diseases to fluctuations in the exchange rate. Against this backdrop, the study sought to examine the management of financial risk (Commodity price volatility). The study used a detailed single case study of a large mining corporation in Ghana to examine the management of corporate financial risk. The study established that there is a comprehensive risk management policy guiding the operations of the mining firm. It was further revealed that the company embarks on risk management with the aim of improving the interest of shareholders and other important stakeholders. The study found that even though AngloGold Ashanti is exposed to financial risks, the company refrains from managing these risks due to their minimal impact on the firm's cash flows. The study recommends, among other things that given the current decline in gold prices, AngloGold Ashanti cannot continue to ignore these impacts caused by the declining prices of gold but rather should consider choosing from the rich menu of risk management techniques to protect its current and future cash flows.

TABLE OF CONTENT

CHAPTER ONE

INTRODUCTION

1.0 Background of the Study

Risk has an effect on a lot of areas of business operations, for instance operation, technology, finance, strategy as well as the environment. Explicitly, internal risks possibly will comprise loss of main employees, considerable declines in financial and other resources, serious interruption to the discharge of communication and information, fires or other physical adversities, provoking disruptions of business activities and/or loss of records, Sani and Chaharmahalie (2010). On the whole, risk as well involves matters such as fraud, waste, abuse and mismanagement which have possible implications on firms' performance. The extents to which firms effectively manage all forms of risks are critical for their financial strength and survival.

Risk management has the potential of benefiting large under diversified shareholders by reducing their individual risk exposures. Such shareholders require the firm to protect their investment through effective and efficient risk management practices. Poor risk management practices on the part of the firm can have negative repercussions on under-diversified shareholders. The extent to which firms manage risks rest on, to a considerable degree on the orientation of the business as well as managers. Managers who are concerned about their interest and the interest of other shareholders are more probable to institute efficient risk management practices. In a study conducted by Tufano (1996) in North America, the findings indicates that firms whose managers possess greater stock administer more gold price risk, compatible with the assertion that managerial risk aversion influences corporate risk management policy. Risk management also can aid managers by allowing them to exhibit their leadership capabilities in a domain in

which their performance depends on uncontrollable risks, such as interest or currency risks. However, irrespective of whether managerial risk aversion or shareholder value maximization is the motivation, engagement in risk management exercises is important (Fatemi and Luft, 2002). The degree and the severity of these exercises, conversely, will be reliant on the nature of the risk–return interrelation.

In corporate finance, an important, yet debatable topic is whether firms should constantly engage in active risk management. From the theory proposed by Miller and Modigliani (1958) it is clear that the worth of an organisation is not dependent on the structure of its risk. Thus companies ought to basically exploit projected profit irrespective of the risk involved. Owners of securities can attain risk transfer through suitable investment apportionments. Nevertheless, the rigorous circumstances associated with the theory are consistently disrupted in practice. Particularly, capital market limitations, for instance taxes and cost of financial distress, resulted in the failure of the theorem and created a domain for risk management. As a result, additional convincing view of the business settings gives a number of defenses as to why companies have to bestow cautious consideration to the risks they face. For instance, Tufano (2003) strongly proposed that using financial innovations, firms can engage in risk management to enhance their value.

Risk management has earned a great deal of recognition in the financial literature. A number of theories have been put forward to clarify why and how businesses handle (or ought to handle) the risks they encounter. For instance, studies such as Stulz (1990), Morellec and Smith (2002) and Carpenter (2000), have extensively examined why and how firms should manage their risks. Most of these studies focused on corporate financial worth boosting as the main objective for handling risk. Accord to Stulz (1990), firms which adopt appropriate risk management practices are more likely to minimize potential losses and thereby increase their value.

Firms all over the world are faced with numerous risks. Fetemi (2002) groups all sources of risk into three: business risk, strategic risk and financial risk. Financial risk, which is the main focus of this study, encompasses exchange rate risk, interest rate and price volatility risk. According to Watson and Head (2009) exchange rate and interest rate risk management are of vital significance to businesses that function globally. A lot of currencies now hover without restrictions contrary to one another and as a result exchange rates can be unpredictable. The prospective benefits of managing or hedging the interest and exchange rate risk exposures of companies have realised increased recognition in recent years. The significance of hedging to corporations is subject to the degree of the probable damages that might result from negative fluctuations in interest and exchange rates. In recent years, the management of Exchange rate risk has turn into one of the main elements in the overall financial management system and this risk management represents one of the most typical components of risk that companies in the global arena come across (Lee et al. 2001).

Looking at it from a simply educational viewpoint, company curiosity in risk management appears interesting. A definitive portfolio theory suggests that investors can eradicate asset-specific risk by expanding their possessions to embrace lots of different assets. As assets specific risk can be prevented in this manner, being exposed to it will not be compensated in the market. As an alternative, investors must embrace a mixture of the risk free assets and the market portfolio, where the precise mixture will be subject to the investor's desire for risk. In this elementary system, businesses ought not to misuse resources on risk management, as investors do not care about the firm-specific risk.

Mining firms are faced with a plethora of risks. The extents to which these risks are managed go a long way to affect not only the mining firms but the macro-economy as a whole. This is because mining firms are important source of taxes and employment for mining economies. Given the important role played by AngloGold Ashanti, Obuasi Mine in the socio-economic development of Ghana, examining how the company manages risk will not only help other firms in the mining industry but will also add to knowledge in the risk management literature.

1.1 Problem Statement

Mining Firms are faced with different types of risk. Paramount among these risks is commodity price volatility. For instance, after attaining high records in the first half of 2008, commodity and metal prices distorted enormously in the aftermath of the global financial crisis, trailing nearly 50% by mid-2009. After picking up in 2010 and 2011, prices of gold since late 2012 have seen downward trend. The volatility in prices of gold and other forms of risks have the potential of disrupting the activities of mining firms. For instance according to Tufano (1996), a fall in gold prices and cash flow can bring to a standstill the most important investment programmes of mining companies: exploration and acquisition. Though the foreign exchange crunch and plummeting gold prices continue to affect mining firms, no work has been done to empirically examine how effective these risk are being managed in the mining industry. The study seeks to bridge this research gap.

1.2 Objectives of the Study

The objectives of the study are categorised into two. These are General objective and Specific objectives.

1.2.1 General Objective

The general objective of the study is to examine the risk management practices of AngloGold Ashanti, Obuasi Mine.

1.2.2 Specific Objectives

The general objective is narrowed to cover the following specific objectives;

I. To examine the major types of financial risks faced by AngloGold Ashanti, Obuasi Mine in its operations.

II. To determine how commodity price volatility risk is managed by AngloGold Ashanti, Obuasi Mine

III. To examine the challenges associated with effective management of risk in AngloGold Ashanti, Obuasi Mine and how such challenges are being addressed.

1.3 Research Questions

I. What are the major forms of risk faced by AngloGold Ashanti, Obuasi Mine in its day-to-day operations?

II. How do AngloGold Ashanti, Obuasi Mine manage its commodity price volatility risk?

III. What are the major challenges, if any, associated with effective management of risk in AngloGold Ashanti, Obuasi Mine?

1.4 Significance of the study

- From a practical point of view, this research will help senior finance officers and risk management official to appreciate the key risks faced by AngloGold Ashanti, Obuasi Mine. This will help such managers to design their policies and programmes in such a way that it improves the shareholder value of the firm.

- Also, the study will examine the challenges affecting the risk management practices of the mining industry of Ghana. The result will go a long way to aid policy makers and regulatory bodies in the mining industry to institute policies and programmes that will improve risk management capabilities of the industry.

- Upon the completion of this research work, the findings will help regulatory bodies such as the Ministry of Mines and Natural Resources and the Ghana Chamber of Mines, to institute regulations that improve risk management practices in the industry.

- Also, the result and findings of this research will contribute to the existing body of knowledge, thereby extending the frontiers of knowledge in the field of risk management in the mining industry.

1.5 Scope of the study

The study examines risk management practices of a mining firm in Ghana. Though risk may come in the form of strategic, business, and financial, the study mainly concentrates on financial risk management. The research was administered in the Obuasi Municipality of the Ashanti region of Ghana. This city was chosen since because the main operation of AngloGold Ashanti, Obuasi Mine is located here. The study was conducted between February, 2014 and June, 2014.

1.6 Limitation of the study

Ideally, the study would have been better if other mining firms were brought on-board. However, due to logistical and time constraints, the researcher concentrated on just a mining firm in Ghana.

Also, due to the busy schedule of most of the mangers, few risk officers were available to be interviewed.

1.7 Organization of the study

The study is organised into five main chapters. The first chapter, also known as chapter one, deals with the general introduction of the research. Specifically, the chapter covers the background of the study, statement of the problem, research objectives and questions, scope of the study, brief research methodology as well as the Organization of the study. Chapter two involves the review of relevant literature on the subject of risk management. The chapter will specifically deal with definition of key concepts, conceptual framework and empirical literature review.

Chapter three describes the methodological perspectives of the study. The strategies adopted in achieving the objectives of the research are discussed in greater details. The issues of research design, study population, sample size and techniques as well as data collection procedure are thoroughly explained in this chapter. Also, techniques employed in analyzing the result are discussed here. Finally, issues regarding reliability and validity of the study are also explained in this chapter.

Chapter four provides analysis and discussions of the various findings. Specifically, the chapter presents the result in the form of tables and charts for easy interpretation and analysis. Also, the chapter discusses the result of the findings taking into consideration the other works in the area of risk management.

The final chapter, chapter five provides a brief summary of the research and the main conclusion with respect to the ideas derived from the study. The chapter also presents recommendation for policy makers, managers, workers and future researchers.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The preceding chapter provided a general introduction to the research. This was done by providing a background to the study, problems statement, objectives of the study, as well as justification of the study. This chapter seeks to present a review of the existing literature and provide an overview of risk management in the mining industry. The chapter also explores what other researchers have done in relation to risk management in the mining industry.

2.1. The concept of risk

The concept of risk is popular in the business literature, especially in finance literature. The occurrence of risk may be seen in the mining company, banking organisation, trading activities or in our normal life. In whatever form that risk chooses to manifest itself, it shows a potential occurrence in the future that may have unanticipated effect on individuals or business entities. Although several definition has been assigned to the concept of risk, there are two different ways of explanation.

Risk can be defined in many ways depending on the context in which it is been used. Jorion (1997) posits that, focusing on the concept of wealth and value, risk can be defined as the volatility of unforeseen outcomes as it affects assets and liabilities. Even though it is apparent to manage volatility in risk, the opinion of the risk manager must be sought in order to properly appreciate the risk management process.

Although some authors' definition portray risk in a negative way, others disagree by providing two-sided perceptions of risk which are indeed more relevant in practice. Risk is defined in the Oxford Advanced Learner's Dictionary as "The possibility of something bad happening at some time in the future; a situation that could be dangerous or have a bad result" (Hornby, 2005). An alternative dictionary also explains risk as "Probability or threat of damage, injury, liability, loss, or other negative occurrence, caused by external or internal vulnerabilities, and which may be neutralized through pre-mediated action. Particularly in finance, risk means the probability that an actual return on an investment will be lower than the expected return." (Business dictionary, 2010).

The forgoing definitions perceive risk from a negative point of view. However, risk is defined by Spedding and Rose (2008) by employing a two sided approach. According to Spedding and Rose, risk can be described as the uncertainty surrounding events and their outcomes, which either enhance or inhibit operational performance; achievement of goals; or meeting expectations of stakeholders. Due to the focus of this study, the two sided approach was employed.

2.2 Sources of Risk

Firms all over the world are faced with numerous risks. Fetemi (2002) groups all sources of risk into three. These are business risk, strategic risk and financial risk. According to the author, business risk forms an integral part of the firm's operations. In other words, such risk is available by virtue of the nature of the firm. Business risk can be in the form of technological, distributional or informational. It is however essential to note that the greater part of this risk can be controlled through the decisions of the management's internal operations. It is an undeniable fact that inability of the firm to enjoy a competitive advantage that would permit it to control its

operating risk will cause its slight chance of being rewarded for bearing this risk. With regards to this, firms that do not mitigate their operating risk to their benefit may eventually fail.

Strategic risk encompasses macro factors and events that affect the firm and, by extension, the value to its shareholders. These events can come in the form of economic or political. It may also manifest domestically or internationally. For instance, the sub-prime mortgage crises in the US represent examples of international events. Strategic political risk may be shown by the fundamental changes in the political regime. One familiar trait of these factors of risk is that they last longer and can, consequently, affect a firm's value for several years.

Unlike strategic and business risk, financial risk may arise as a result of adverse variations that occur over relatively shorter time horizons in interest rates, commodity prices, equity prices, and foreign currency values. According to Fatemi (2002), adverse changes in interest rates, commodity prices, equity prices and foreign currency values may translate into real losses in shareholder value. The extent to which these losses may manifest depends, to a larger extent, on the form and the magnitude of the firm's netcash flow exposure to each of these factors. The question that needs to be answered is whether these short terms financial risk is worth managing by the firm. Nonetheless, the answer to this question surely depends on whether the firm has an advantage of acquiring information or not over the shareholders in the capital markets.

2.3 Types of Risk Exposures in the Mining Industry

Mining companies are exposed to all forms of risks that other firms are exposed to. For instance they are confronted with business, strategic and financial risks. Even though all these sources of risk are important to the mining firms, for the purposes of this study, much emphasis will be placed on financial risks faced by mining firms. Financial risk may occur as a result of adverse

changes over relatively shorter time horizons in interest rates, commodity prices, equity prices, and foreign currency values. According to Fatemi (2002), adverse changes in interest rates, commodity prices, equity prices and foreign currency values may translate into real losses in shareholder. The various forms of financial risk and how they are mitigated are discussed in detail below

2.3.1 Exchange Rate Risk

Risk associated with exchange rate is common among other forms of risk that firms operating in the global environment grapple with. In recent years, due to globalization, managing of exchange rate risk is now one of the important factors in general financial management (Werner et al., 1996; Lee et al., 2001). The academic community, over the years, has moved along with the rising significance of exchange rate risk. This verified by the intense theoretical and empirical research in this area of academic research. Lessard 1989) and Dhanani and Groves (2001) refer to exchange rate risk as the means by which movements in exchange rates causes the financial performance of firms as measured by conventional financial statements and/or corporate cash flows. This type of risk is further categorized into translation exchange rate risk, transaction exchange rate risk and economic exchange rate risk. This type of risk is further discussed in the sections below:

2.3.1.1 Translation exchange risk

Translation exchange rate risk is explained as introduction to accounting. This assesses the exchange rate volatility effect on the financial statement of the group of company. Risk associated with translation exchange rate is the outcome of the restatement of financial statements of foreign subsidiaries into parent currency terms for the purposes of consolidation. The translation process as well as variations in exchange rates, may result to translation gains or

losses in the annual accounts as firms seek to arrive at a 'balanced' balance sheet; these gains and losses have conventionally been termed translation risk (Dhanani, 2003). Academicians in finance are of the opinion that firms managers should desist from managing their translation exchange risk because it deals with external reporting of past events and thus, does not in any way provide meaningful implications for the future cash flows and, in turn, for the market values of firms (Dufey, 1972; Srinivasulu, 1983). Moreover, use of strategies such as the currency denomination of debt and currency derivatives to manage the risk may create an adverse effect on corporate market value (Asiamoney, 2001). On the other hand, earlier empirical research based in US investigated into the risk associated with management of exchange. The author stated that translation risk formed the core of most firms' risk management policy (Rodriguez, 1980). Translation gains and losses most of the had very noticeable effects on the total reported profitability of firms; effects which, in some cases, were even more significant than those caused by the operational activities of firms (such as the level of sales and profit margins) (Eitemann et al., 2000)

2.3.1.2 Transaction exchange risk

Transaction exchange rate risk is a cash flow risk which comes to the fore when firm operating internationally strives to change their foreign currency cash flows into local currency terms and the rate of exchange at the date is not known for certain. For instance if AngloGold Ashanti, Obuasi Mine, a gold mining firm in Ghana converts its proceeds from gold sale into Ghana Cedis (home country) it faces transaction exchange rate risk. For most multinational companies, transaction exchange rate risk is the commonly found and most noticeable form of risk. Literature on finance supports that this type of risk be managed due to its direct cash flow and in turn market value implications for firms (Srinivasulu, 1983). To minimize the impact of this

form of risk, financial instruments or other strategies that are reflections of these instruments may be used by firms, for example, money market hedges. In this regard, the rate of exchange for the dates that companies care about are been fixed by the tools. On the other hand, internal measures can be undertaken by the firms. These measures include leading or lagging payments and receipts, which serve to decrease their general exposure heights. According to Dhanani (2002), previous studies on transaction risk in the United Kingdom and elsewhere show that this risk is very important for firms operating in the multinational environments. With respect to risk management strategies adopted, even though internal measures are used by firms, financial instruments are preferred in most cases. Nonetheless, a forward contract is of higher preference among them as a result of their relatively lesser costs, inborn flexibility and simple organisation (Duangploy et al., 1997). Though innovative instruments like option contracts are used, they are less common since senior management are hesitant with such instruments in the light of their speculative nature, high up-front premiums and resource intensity (Belk and Glaum, 1992).

2.3.1.3 Economic exchange rate risk

Unlike transaction and translation exchange rate risk, economic exchange rate exposures assess the impact of changes in a firm's earnings and cash flows. Economic exchange rate risk is explained as the effect of long-term movements in exchange rates on the expected future cash flows of firms and, in turn, their total market values. Obviously, it has been viewed in most financial literature as the most essential form of exchange risk (Belk & Glaum, 1990; Miller & Reuer, 1998). Even though this form of risk is seen as an extension of transaction exchange rate risk, it differs from transaction risk in that it deals with the long term cash flow of the organization.

The future cash flows may suffer from long term movements in exchange rates. This is because they can truly cause the firms' possibilities of generating those cash flows by influencing their level of sales, prices and input costs. The total values of firms are threatened to the extent that the exchange rate related changes to cash flows are not offset by corresponding changes to the prices of goods (inflation). In other words, economic exchange risk is a function of movements in real rates of exchange (Dhanami, 2002).

2.3.2 Price Volatility Risk

In most cases, companies who produce locally and export their produce to the international market are at of price volatility. That is, the prices of their export may fluctuate from the expected prices. Gold mining firms suffer challenges of gold price fluctuations; gold prices have experienced considerable volatility (between 2013 & 2014). As a result verity of policies has been developed to deal or manage this volatility (Dhamani, 2002).

As a matter of fact, concerns may be raised as to whether firms in the gold mining industry would make any effort to manage gold price risk. Given an extensive gold derivative market, gold price risk can be modified by investors almost as well as mining firms can. Looking at the somehow transparent nature of the mining industry and the solid nature of its assets, many corporate risk management rationales resulting from considerations of asymmetric information and deadweight costs of financial distress seem almost insignificant. There might be theoretical predictions that firms do not manage gold price risk. The fall in the prices of commodity and the increased cost of mining indicate that producers have pursued to control costs to maintain margins. In the case of gold, producers have, where practical, targeted higher-grade ore instead of lower-grade material, which became (EY, Global Limited, 2013). In April 2013, gold prices

reduced drastically which increased the stress to hedge new production forward. Mining companies needs to be careful about the idea of hedging in periods of price reduction and refusing to hedge when prices increase. Preferably, one needs to hedge in periods when metal prices are closer to their peak. The ideal way is to assess when the trade in prices are above their historic trend average — where there is a greater possibility of making gains from hedging rather than losses. The current reduction in the prices of gold shows how fluctuations in gold prices pose as a challenge to in-house management systems' quest to respond in an appropriate manner.

2.4 Managing foreign Exchange Risk

According to EDC (2011), most corporations make an effort to limit the risk of volatility in exchange through the use of hedging instruments such as Money Market Hedge, Forward Exchange Contracts, Futures, Options and Swaps. While the management of foreign exchange risk is seen as critical for most companies, other see the management of this risk as too complex, expensive or time wasting. Several people may have any idea about instruments and techniques employed in hedging or have believe that hedging is a speculative action. Nevertheless, firms that do not wish to manage foreign exchange risk may be making the assumption that exchange rates will be permanent at their current levels or move in a direction that will be advantageous to the company – something that nearly looks like speculation.

Bodie and Merton (2000) provide four broad possibilities of managing all forms of foreign exchange. Firstly, companies can simply dodge risk. This would mean choosing to sell or buy in markets that are currency risk free. To achieve this in an open economy is practically impossible because even if firms manage to avoid direct exposure, at least some of their suppliers, customers, or competitors will bear some exposure. Secondly, firms can lessen the probability or

the severity of losses. For instance, a Ghanaian firm that exports to the US can finance some of its operations with US dollars or purchase materials from US suppliers. Again, there could be transfer of risk from firms to others. This can be achieved in three possible ways: the first possible way is through hedging. That is, potential gains from favorable currency changes can be sold to make up for losses from unfavorable changes. A Japanese importer, for instance, can enter into a forward contract to buy Chinese lire to fund its purchases from its Chinese supplier. The second means is by insuring. This comprises paying a different party to assume their currency risk. For example, some firms insure with currency options, whereas others do so by invoicing in Swiss francs rather than in foreign currencies. Finally, they can achieve this through diversification. Someone who imports good can do so from suppliers in different nations rather than from just one supplier. Diversifying through this means spreads risk over different, possibly uncorrelated currencies. The suppliers bear some of the risk of the importer because the importer might purchase from the suppliers with the more favorable currency rates if he is to assume the risk alone. The management of foreign exchange risk, according to EDC (2011) can be done through the use of four key steps. These are identification and measurement of foreign exchange risk, development of foreign exchange policy, hedging and evaluation and adjustment. Diagram 2.2 depicts the processes.

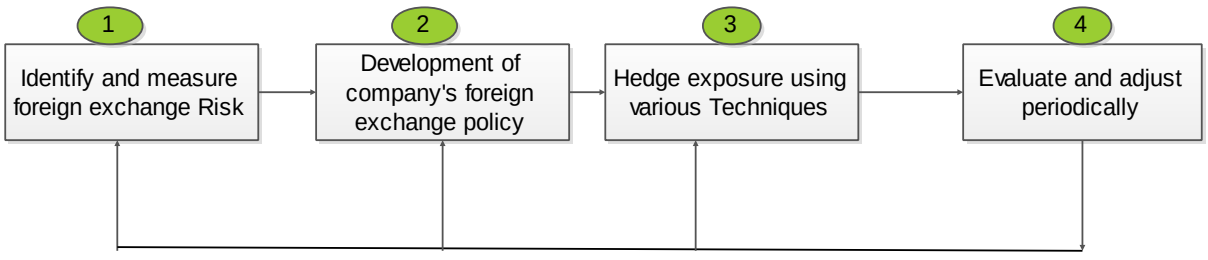

Figure 2.2 Managing Forex Risk (Diagramatic Illustration)

Source: Adapted From EDC White Paper (2011)

Step one deals with identification and measurement of the foreign exchange exposures that one wishes to manage. Once you have calculated your exposure, you need to develop your company's foreign exchange policy as part of **step two**. This policy should be endorsed by the company's senior management and usually provides detailed answers to questions such as:

• When should foreign exchange exposure be hedged?

• What tools and instruments can be used under what circumstances?

• Who is responsible for managing foreign exchange exposure?

• How will the performance of the company's hedging actions be measured?

• What are the regular reporting requirements?

Step three involves putting in place hedges that are consistent with your company's policy. For example, you may want to increase the value of raw materials imported from the U.S. to partly offset the exposure created by sales to U.S. buyers. Alternatively, you may put in place basic financial hedges with a bank or foreign exchange broker. The most commonly used financial hedges are discussed further below.

Step four requires that you periodically measure whether the hedges are effectively reducing your company's exposure. Establishing clear objectives and benchmarks will help facilitate this evaluation. It will also alleviate the fear of those responsible for implementing the policy that they have somehow failed if the exchange rate moves in the company's favour and the hedges they put in place prevent the company from gaining.

2.5 Gold Price Volatility Risk Management

There are several reasons why the gold mining industry serves as an area for strategic research: fluctuations in gold prices affect all gold mines; there has been enormous volatility in gold

prices; in their quest to manage this volatility capital markets have developed a various techniques; firms have employed numerous rich policies to help manage gold prices; and finally, enactment of these policies is openly unveiled in this industry, permitting us to observe directly the operations of the firm's financial risk management. Risk may be managed by means of hedging, diversification, and insurance (Merton 1993). Several instrument of hedging comprises over-the-counter forward sales of gold, ex-change-traded futures contracts, gold or bullion loans, gold swaps, and spot deferred contracts (which are economically the same as rolling forward con-tracts). Any firm that wants to embark on insurance strategies can employ either ex-change-traded or over-the-counter gold put options, or can dynamically repeat puts by trading forwards and futures. The advantages associated with risk management instruments offer firms the opportunity to customize their gold price exposure, and firms have accepted risk management. For example, over four years American Barrick Resources Corporation adopted put and call options, bullion loans, gold warrants, spot deferred contracts, forward sales and customized gold-linked equity financings as part of its risk management program (Tufano and Serbin (1993).

2.6Risk Management Practices in the Mining Industry

Huge, composite and time consuming projects like mining activities are associated with substantial risks. If companies determine these risks before they actually manifest, taking proactive measures can manage and control are them. The procedure for identifying, assessing, mitigating and controlling the risk is the risk management process (Bijl and Hamann, 2002). Sinkey (2002)suggests that contemporary risk management in the gold mining industry can be highlighted by five verbs and these are; identify, measure, price, monitor and control. According to Bijl and Hamann (2002), the method of risk management is normally made up of four main stages. These include identification of risk events, planning, risk mitigation, risk assessment, and

tackling. Complex and large scale businesses such as those in the mining industry are exposed to considerable amount of risks. In order to ensure that such risks are controlled, there is the need to effectively identify these risks. An organization's failure to properly identify and assess major risks facing it may lead to significant losses of stakeholder value and eventually lead to bankruptcy. It is therefore incumbent on the senior leadership and management to map up strategies to effectively manage the major risks confronting the organisation.

The process of identifying, assessing, mitigating and controlling these risks is the subject matter risk management. According to INCOSE (2002), risk management is a planned procedure which intends to understand and appreciate the wrong happenings, and devising the appropriate strategies to handle each of the identified risks. It consists of the projects and activities that links to the identification, assessment, reduction and acceptance of risks.

The benefit of risk management can be enjoyed by a greater, under diversified shareholders by decreasing their personal exposure to risk. Tufano(1996), researched into the corporate risk management activities in the North American gold mining industry. The study found that, more gold price risk is managed by firms whose managers hold more stock. This conforms to the assertion that managerial risk aversion influences corporate risk management policy. The benefits of risk management can be extended to managers by enabling them to show their greater abilities in a world in which their performance depends on uncontrollable risks, such as interest or currency risks.

2.7Risk management processes

Risk management is not an event, it is a process. It is an organized process which seeks to minimize risk in organisations. The Institute of Chartered Accountants in England and Wales,

ICAEW (1999) groups the risk management process into six distinct categories. These processes are depicted in figure 2.1 below

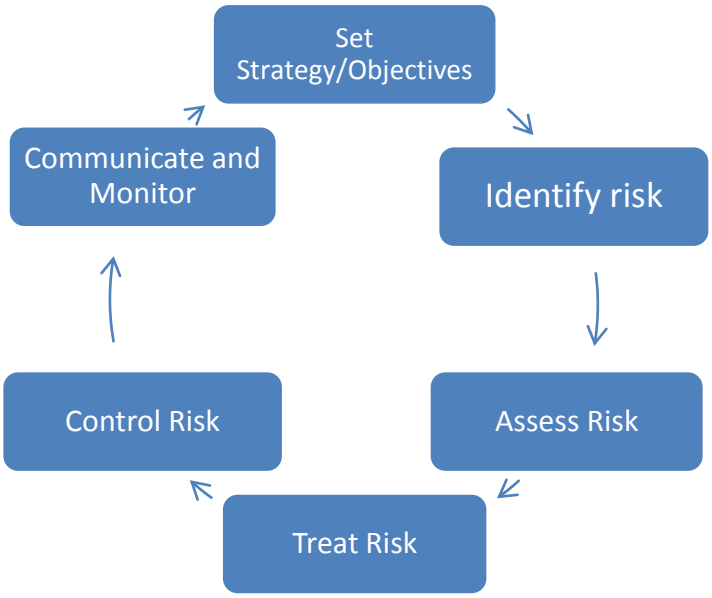

Figure 2.1 Risk Management Process

Source: Adapted from Institute of Chartered Accountants in England and Wales, (1999)

The six processes involved in risk management include strategy/objective setting, risk identification, risk assessment, Risk treatment, Risk control and communication and monitoring of risk. According to Shankir and Walder (2007), the effective management of these processes will help the organisation wishing to mitigate risk to achieve its objectives. These six objectives are further discussed in details below.

2.7.1 Objective/Strategy Setting

The first step is to set clearly the strategies and objectives. According to ICAEW (1999), it will be difficult to know which activities that might result to risk that would negatively affect organisational goals if clear objectives are not set irrespective of the scope of the inquiry. Thus,

for risk to be effectively managed there is the need for the organisation to clearly set its strategy as far as risk management is concerned.

2.7.2 Risk Identification

When an organizational problem is identified and tackled in advance, it ends up controlling any potential risk. Theories underpinning the risk–return relationship posit that a reward is related to the assumption of certain types of risks, but not others. Thus, one can only determine whether a risk management activity will lead to a reward or not based on the nature of risk that is been tackled. Techniques that can be employed to identify risk include: Brainstorming, Event inventories and loss event data, Interviews and self-assessment, Facilitated workshops, SWOT analysis, risk questionnaires and risk surveys, scenario analysis.

2.7.3 Risk Assessment

Appropriate identification of risk is a necessary condition for an organizational risk management action to be taken. When risk is assessed wrongly, it can make management's attempt to assess it fruitless. Hence, organizations are cautioned to appropriately identify risk by adopting the risk identification processes discussed. The act of identifying risks is itself a stage on the road to risk assessment. There is some probability that any risk detected nearly by default will affect the organisation. According to ICAEW (1999), the risk assessment process can be achieved using either qualitative or quantitative techniques. The qualitative techniques may include risk rankings, risk maps, risk maps with impact and likelihood, risk mapped to objectives, identification of risk correlation.

.

2.8Theories of risk Management

Fatemi (2002) risk management is founded on two important theories. These are the shareholder value maximization theory and managerial risk aversion hypothesis. According to the author, the shareholder value maximization hypothesis predicts that a firm will engage in risk management policies if, and only if, they enhance the firm's value and thus its shareholders' value. This value enhancement can arise from one of three sources: (1) minimization of the costs of financial distress, (2) minimization of taxes, and (3) minimization of the possibility that the firm may be forced to forego positive NPV projects because it lacks the internally generated funds to do so.

The second theory, according to Fatemi (2002), the managerial risk aversion hypothesis is based on an agency argument. It holds that managers will seek to maximize their personal wealth, at times, at the expense of shareholders. Specifically, when the interests of shareholders are not perfectly aligned with those of the managers, the latter may pursue risk management strategies designed to insulate their own personal wealth from the effects of changes in interest rates, commodity prices, or foreign currency values. These steps may be taken without regard for the consequences of these decisions for shareholders' wealth.

2.9Benefits of Risk Management

The shareholder value maximization hypothesis predicts that a firm will engage in risk management policies if, and only if, they enhance the firm's value and thus its shareholders' value. Thus, if a risk management policy is geared towards enhancing the value of the firm, then it is beneficial. This value enhancement may arise in the form of minimization of the cost of financial distress, minimization of taxes and minimization of the possibility that the firm may be forced to forgo positive NPV projects because it lack the internally generated funds to do

(Fatemi and Luft, 2002). Apart from these benefits, the following benefits have been identified by EDC (2011):

- Better and more detailed perception of the content of the risks, what their consequences are, and how they interact.
- Better planning, taking into account the imposed risks; better responding on risks occurring, and a better approach in minimizing the effects of a risk.
- Feedback during the design and planning process about the level of risk of risk events, this can be used to avoid risks.
- A possibility to check the sensitivity for changes in the decisions made.
- Documentation and integration of knowledge, which normally is only known by individual experts
- Insight and knowledge to take better decisions.

Financial distress arguments for risk management, developed by Smith and Stulz (1985), hold that by reducing the likelihood of costly financial distress, risk management can increase the expected value of the firm. This increase in value comes from the reduction in deadweight costs, and an increase in debt capacity, which in turn can benefit the firm through valuable tax shields or reductions in agency costs of excess free cash flow. Shapiro and Titman (1986) extend the costs of financial distress to include the deterioration of valuable relationships with buyers and suppliers who value long-term access to the firm, for example to provide ongoing service. Gold mining firms encounter financial distress if the price of gold falls below their costs to produce gold and make fixed financial payments.

2.10 Challenges of Risk Management

Implementing and effective risk management strategy or programme is not without challenges. These challenges may be classified as cultural, or having to do with attitudes and perceptions, rather than with the mechanisms of the implementation. The first challenge is resistance to change. Most people and organisations prefer the status quo and resist the introduction of new concepts, processes and procedures. An attempt that can be made to meet this challenge is by effective communication. By writing memos to explain process, its purpose, and its implementation will go a long way to reduce the level of resistance. Another problem can occur during the initial assessment of risk. Some people on a program will react negatively to the connotation of having a risk in their area of responsibility rated as "High". To overcome this problem a clear template for rating is necessary and periodically communication with the responsible person about the true rating of the risk. Furthermore it is important to introduce new metrics one at a time, to give people time to assimilate and see the benefits of the new processes and concepts. In this way you create a certain awareness which leads to not only acceptance of the process, but also active "customer" participation in the process (INCOSE, 1995).

2.11 Risk management and internal controls

AngloGold Ashanti, Obuasi Mine has laid down measures to effectively manage the risk associated with the operations of the company in order to promote the making and protection of shareholder wealth. There is some degree of satisfaction on the part of the board of the mine as regards continuing practice of identification, evaluation and management of significant risks and institute internal controls. The shortfalls that are detected in the mine are immediately responded to given that the process of mitigating risk is included in its overall risk management framework.

The internal control of the group has a well organised system which is based on policies and guidelines, in all material subsidiaries and joint ventures under its control.

The risk strategy and policies formulated by executive directors and senior management are assessed and accepted by the board. Management is answerable to the board and has created a system of internal controls to manage significant group risk. This system helps the board to effectively manage the risk associated with the operations of the group by appropriately performing their responsibilities in order to maintain shareholder wealth.

The Obuasi Mine has instituted a policy for group risk management with supporting standards that makes available an all-embracing and reliable framework to evaluate and manage risks, which are ranked using a similar methodology. The senior management of the company evaluate and report material risk. The company's risk management systems satisfy the requirements of the King Committee on Governance: Code of Governance Principles for South Africa (King III) and the United States Sarbanes-Oxley Act (SOX).

2.12 The Mining Industry of Ghana

The mining industry of Ghana is has contributed immensely to the socio-economic developing of Ghana since the 15th century. Today, the industry is the second largest in Africa after South Africa and the 10th in the world. It is estimated that between 1496 and 1997, 2,488 metric tons of gold (80 million ounces) have been produced in Ghana (Kesse, 1985; Ghana Chamber of Mines, 1998). Over the years, successive governments have demonstrated commitment in improving the fortunes of the mining industry. For instance in 1983, as part of the Economic Recovery Programme (ERP), the government of Ghana gave the mining sector a great deal of attention by financially supporting the industry. Also, the industry received massive support in

the area of Foreign Direct Investment (FDI) within the same period. Laws and other regulations have also been introduced with the aim of streamlining the operations of the mining industry and boosting its performance. Specifically, between the years 1984 and 1995, a number of regulations and policies were instituted in the mining industry.

For instance, the establishment of the Minerals Commission in 1984 and the promulgation the minerals and mining code in 1986 have contributed to the development of the industry. In addition to the regulatory framework developed via the laws and institutions, generous incentives were provided to foreign investors to boost foreign direct investment in mining. For example; corporate income tax on mineral production of private companies in Ghana decreased from 50-55% in 1975 to 45% in 1986 and 35% in 1994 (Campbell, 2003; Akabzaa and Darimani, 2001)

Over the years, the contribution of the mining industry, especially the gold mining industry cannon be underestimated. The industry has contributed immensely to the export drive of the country. For instance, in 2005, gold became the leading foreign exchange in Ghana, overtaking cocoa in that particular year. In 2004, the mineral revenue generated by the government was estimated at 995.2 million dollars, contributing to about 13% of the internally generated revenue of the country. Though the Ghanaian economy is not by the United Nations definition, a mining economy, the minerals sector has made noteworthy contributions to foreign exchange earnings and Gross Domestic Product (GDP). Currently, Ghana's mining sector contributes approximately 40% of Gross Foreign Exchange (GFE) earnings and accounts for approximately 5.2% of GDP (Ghana Minerals Commission, 2006). In 2000, minerals accounted for 38.96% of total export earnings, followed by cocoa (22.51%) and timber (9.03%) (ISSER, 2001). Indeed, mining remains a key industry for the growth and development of the Ghanaian economy

In spite of the successes chalked, the industry is beset with a number of challenges. In recent years, the decline in gold prices coupled with the general economic slowdown has impacted negatively on the operations of the mining industry. Gold mining companies such as the Newmont Ghana and AngloGold Ashanti, Obuasi Mine have already reduced the number of workers working in their respective companies with the aim of reducing operational costs. Given the strategic importance of the gold mining industry of Ghana, the current research intends to examine the risk management techniques adopted by the mining industry of Ghana.

2.13 Main Activities of mining companies in the Ashanti region

As the name portrays, AngloGold Ashanti Ltd, Obuasi Mine is a gold mining company situated at Obuasi in the Ashanti Region. Its main activities are mining and processing of gold. The mining is done from both surface and underground operations where the ore is extracted and conveyed to the processing plant for milling in order to derive the final product in terms of gold – ounces.

2.13.1 Human Resources

In support of AGA's principles, values, vision and mission, the department of human resources envisages to support the entire operation in meeting its objectives through its most valuable resource – that is people within the organization: To ensure that AGA's vision and values are cascaded down to all levels, whilst creating the right culture and environment for AGA Staff to help the company in achieving its short and long term goals requires the right employees to meet such targets. This department play active and strategic role in overall business process by designing HR systems and procedures, which are aligned with AGA priorities and business objectives.HR department is headed by senior manager- HR and senior manager-

Administration. HR division has sections which are Industrial Relations headed by a manager, training and development headed by Training manager, HR Information Systems headed by a HR Systems manager and lastly manager of administration.

2.13.2 Mining

Mining is the method of extracting the ore from its normal source or site, once the ore body has been recognized and developed sufficiently for extraction. It comprises drilling, blasting, tramming and hoisting, skipping and hauling of the ore to the treatment plants for processing. There are also manager who overlook the various processes of mining and hauling gold form both underground and surface operations. This is where the core activity of the mine sits. The ore (gold bearing rock) is the raw material that needs to be transformed into a finish product (Gold) by the application of chemicals at the processing plants. This consists of the mining engineers, blastmen, drillers, mine captains, loco and Wagner operators and so on.

2.13.3 Engineering

The maintenance of the mining equipment and processing of gold at Obuasi is done by the Engineering section of the mine. Ore from underground is transported to STP (sulphide treatment plant) and goes through three (3) stages namely; crushing, milling and floatation before the gold is finally extracted. The ore first crushed into smaller pebbles and then milled into fine material then through floatation. The process of floatation involves the separation of the sulphide from the gauge material. The gauge material is thrown away as waste material whilst the sulphide is taken through a process called biological oxidation (i.e. conversion of sulphide into liquid). This

division also is considered as part of the core activities of the mine as its activities are directly linked to production.

2.13.4 Sustainability

This is one of the non-core divisions of the mine and it comprises the public relations, community relations, estates, environmental, medical services and business development departments. The focus of this unit is to provide supporting services to the operations of the mine. The public and community relations department seek to enhance the social licence to mine through stakeholder engagements and tends to facilitate the mine corporate social responsibility initiatives. The business development unit also ensures adequate supply of timber for both underground and surface operations as well as developing alternative livelihood programs within the municipality. The health services also ensure proper medical services are provided to employees and their dependents. Finally the environmental department ensures the company operates without polluting the environment as enshrined by regulatory bodies like Environmental Protection Agency (EPA).

2.13.5 Staffing Situation

AngloGold Ashanti Mines at Obuasi is made up of eight (9) divisions as at January 2014. These are: Mining; Finance; Human Resources; Mine Technical Services; Processing; Projects; Health Safety and Environment (HSE); Sustainability and Engineering. As at January 2014, the Company had permanent staff strength of 4,253.The staff cut across both Ghanaians (locals) and foreigners (Expatriates). There are 41 expatriates, 3,076 employees as junior staffs and 1,136 as senior staffs. The employees are dominated by males. The few female workers largely scatted around the surface working environment. This situation is primarily due to the physical and difficult nature of underground mining. The company is headed by a Managing Director and is

assisted by his deputy and a personal assistant. Each of the 9 divisions is headed by a senior Manager whilst the various departments are being headed by a manager each. The departments are further divided into sections which are headed by Superintendents who are being supported by managers Supervisors, Foremen and so on. The organisational structure of the company is the tall type. However, plans are far advanced to make it flat in line with the current restructuring. The current organisational structures of the AGA of Obuasi Mine, Mining, Human Resources

CHAPTER THREE

RESEARCH METHODOLOGY AND CASE STUDY PROFILE

3.0 Introduction

The previous chapter dealt with the review of relevant literature of the study. This chapter presents the research methodology and the profile of the research organization. Specifically, the chapter is made up of research design, methods and procedures used in collecting and analyzing data of the study. It also examines the study population, sampling technique and the sample size of the study. In summary, the chapter has the following sections: research design, population of the study, sample and sampling procedure, data collection method and data analysis procedure.

3.1 Research Design

The major strength of a research design is that, it maximises objectivity, replicability and generalisability of findings. Thus, this design ensures that the researcher set aside his or her personal experiences, perceptions, and biases to ensure objectivity in the conduct of the study and the conclusions that are drawn.Saunders et al. (2009) explains research design as a general strategy of how research questions are answered. He further explained that it as the overall plan of the project. The research design serves as the blue print for collecting, measuring and analysing data. The research design may consist of research purpose, research approach and research strategy. According to Babbie (2010) the purpose of a research may be classified in terms of descriptive, exploratory, or explanatory. Exploratory studies are normally for under researched area and which needs a theoretical framework for succeeding studies. On the other hand, descriptive studies comprehensively describe events and situations through observations (Babbie, 2010). Explanatory also known as causal studies shows probable cause-and-effect

relationships (Yin, 2003).For the purposes of this study, an exploratory design is employed. According to Robson (2002), exploratory design is an appropriate means of inquiry into new happenings. This design was adopted because it enabled the researcher to gain more insight into the subject of risk management in the mining industry of Ghana. Based on the exploratory nature of the study, a qualitative approach is used. This is because interview was the main data collection instrument employed.

Also, a single case study strategy was adopted for the purposes of this study. The case study strategy was adopted because it presented an opportunity to the researcher to address in details the explanations for how and why AngloGold Ashanti, Obuasi Mine (Ghana) cope with its risks in the way it does.

3.2 Population of the study

Population is the complete set of cases within which a sample is drawn (Saunders et al. 2009). It is the collection of prospective individuals and objects for a study. Busha and Harter (1980) also defined a population as a set of persons or objects that possesses at least one common characteristic. For the purposes of this study, the study's population consists of risk management officers of AngloGold Ashanti, Obuasi Mine (Ghana).

3.3 Sample size and Sampling Technique

Ideally, it will be better for a researcher to study the entire population since it will elicit responses from all parties. However, due to cost, time and accessibility constraints, researchers are often forced to acquire data from a smaller representation of the whole population, called sample (Cohen, et al 2000). This study selected a subset of the population for the purposes of analysis. In doing so, a sampling technique was adopted. Saunders et al. (2009) categorized

sampling technique into two. These are the probability or representative sampling technique and the non-probability or judgmental sampling technique. According to Zikmund (2000), probability sampling refers to the sampling technique in which every member of the population will have a known non - zero probability of inclusion, while a non - probability sampling is a sampling technique in which units of a sample are chosen according to individual judgment or suitability. This study adopted a non-probability sampling technique to the chief risk officers and 2 other risk officers of the mining firm. These officers were selected because the researcher believes they have what it takes to explain the risk management practices of the company.

3.4 Sources of Data

Data is important for the successful completion of a study. According to Saunders et al. (2009), research is basically about gathering the relevant data/information needed to answer various research questions and thereby helping to solve a problem. The data for the study could be collected from two main sources: the primary and secondary sources. Primary data consist of newly collected data for the specific purpose; whereas secondary data are already obtained data for some other reason (Saunders et al., 2009). For the purposes of this study, both primary and secondary sources of data were employed.

3.5Primary Data Sources

Primary data constitutes data collected specifically for a study to investigate into a particular problem by the use of interviews, questionnaires or observations. The primary data for this study was collected mainly through the use of semi-structured interview. The interview approach was used because the study adopted an exploratory research design, which is appropriate when

interview is used (Saunders et al. 2009). Respondents verbally responded to an interview guide and their responses were captured for the purposes of analysis.

3.6 Secondary Data Collection

Secondary data was obtained from journals, books, articles, newsletters and other useful materials on the internet. The secondary data helped in obtaining information in the area of risk management in the mining industry.

3.7 Data collection Instrument

The interview guide was the main data collection instrument used in this study. The interview guide permitted the researcher to obtain qualitative data to complement the data obtained from the questionnaires. The reasons for conducting interview was to enable the researcher explore more into the subject matter. The questions in the interview guide were crafted in such a way that it answers the research questions stated earlier in chapter one of this study. In designing the interview, the researcher considered various types of interviews. Merriam (1998) grouped the types as highly structured/-standardized, semi structured and unstructured/informal. According to the author, in the case of structured/-standardized interviews, the wording of the questions and the order of questions are predetermined and these interviews are like an oral form of written survey. Also the semi-structured interview is where a mix of structured and unstructured questions are used. For the unstructured interview, the questions are open-ended questions and it is flexible and exploratory and it is more like a conversation.

The study adopted the semi-structured interview to gather the information from respondents. This structure was adopted because the researcher found it to be appropriate based on the study.

The data collection made it possible for all the respondents to share their opinions where it became prudent to have similar art for every interviewee. In other areas, the questions were asked based on the responses from the respondents.

2.8 Interview guide Administration

As indicated earlier, the purpose of this interview was to gather as much information as possible from the managers involved in risk management at AngloGold Ashanti, Obuasi Mine (Ghana). Prior to the interview, the interviewees were informed about the research's objective and were guaranteed of confidentiality of the information that will be provided. The researcher personally administered the interview using the face-to-face approach. To ensure that all information provided is captured, the researcher sought permission from the interviewees to record the interview.

2.9 Method of Data Analysis

Raw data that is collected through questionnaire and interview guide conveys little or no meaning to end users. Data collected must be analyzed and presented in a manner that makes 'sense' to users of such information. Data analysis is important because it enables the researcher to make conclusions and meaningful recommendations based on the study.

According to Saunders et al. (2009), data analysis involves breaking down data and to make clear the nature of the components parts in order to establish relationship between them. Data can be analysed qualitatively or quantitatively based on the nature and objectives of the study. Analysis of qualitative data enables a researcher to come up with a theory using data, whiles analysis of quantitative data allows the researcher to explore, present, describe and examine trends and relationships with a quantitative data (Saunders et al., 2009).

Various data analysis techniques were considered to determine their applicability for study. Based on the nature of the research questions and the nature of the data collected, the data collected was qualitatively analyses. The interview was analysis based on the procedure proposed by Miles and Huberman (1994). First, the interview was transcribed and summarized. Second, the transcribed data was examined to establish trends and relationships. Finally, the result was presented in a form of tables and figures..

3.10 Validity and Reliability of the study

According to Saunders et al (2009), the credibility of a study, to a large extent, hinges on the validity and reliability of the study process. Validity is explained as the level at which a measure mirrors the concept it aims to measure. Trochim (2005) argues that if a study actually measure what they claim to, and if there are no logical errors when drawing conclusions from the data, the study is said to be valid. On the other hand, reliability refers to the extent to which studies can be replicated. In order to attain a high level of validity, much attention was given by the researcher to the design of the questionnaire and the interview guide. The researcher ensured that the instruments measured what they intended to measure. To ensure the validity of the instruments, the questionnaire was validated by a research supervisor of KNUST Business School before they were administered. Secondly, a pre-test was undertaken to ensure that inconsistencies in the research instruments are corrected.

3.11 Ethical Considerations

In business research, ethics involves ‘codes of behaviour’ that governs the researcher’s activities (Zikmund, 2000). The author further explained that ethical hitches may occur in a business

research if there exist conflicting perspectives about behavioural expectations. He further explained that it is important for the researcher to consider any ethical issues that might affect the study.

In conducting the research, the researcher took into consideration all facets of research ethics as regards the rights and obligations of both the researcher and the respondents. First, the researcher tried as much as possible to avoid plagiarism by appropriately citing and referencing all materials used in the study. Second, the researcher followed all the code of conduct as indicated in the research manual of KNUST School of business. Third, in order to do away with any form of deceit, the researcher briefed all the respondents about what is entailed in the research process and by assuring them of keeping any information given in course of the study process confidential.

3.12Overview of the study Area

AngloGold Ashanti, Obuasi Mine, is among the world's most successful companies in gold mining. Its mining activities can be found in ten countries on four continents with twenty one operations. The portfolio of AngloGold Ashanti are not limited to long-life, relatively low-cost assets and differing ore body types in vital gold-producing regions around the world. The operations of the mine includes deep-level hard-rock mining, open-pit mining, exploration, brown and green fields and also research and development.Formerly, the Obuasi operations were assets of a Ghanaian based company, Ashanti Goldfields, but ownership was transferred to AngloGold Ashanti, a South African mining company in 2004 and they started operations in that same year (AngloGold Ashanti, 2007). The two leading mining companies in Africa's business dealings were in conformity with the group's strategy of attaining geographic and ore body diversity, and resulted in an improved portfolio of shallow, low-cost surface mines.

AngloGold Ashanti, Obuasi Mine operates in several countries across the world and they include: Ghana, Argentina, South Africa, Mali, Australia, Brazil, Guinea, Namibia, Tanzania and the United States. Total gold production in 2005 increased to 6.2 billion which represents an improvement by 6%.Out of this, 2.7 million ounces representing 43% came from deep-level hard-rock operations in South Africa and the remaining 3.5 million ounces also representing 57%came from the shallower and surface operations. In various countries like the United States (Alaska) in North America, Colombia in South America, the Democratic Republic of Congo (DRC) in Africa, and Mongolia, Russia and China in Asia, and the mining group undertakes extensive exploratory operations.

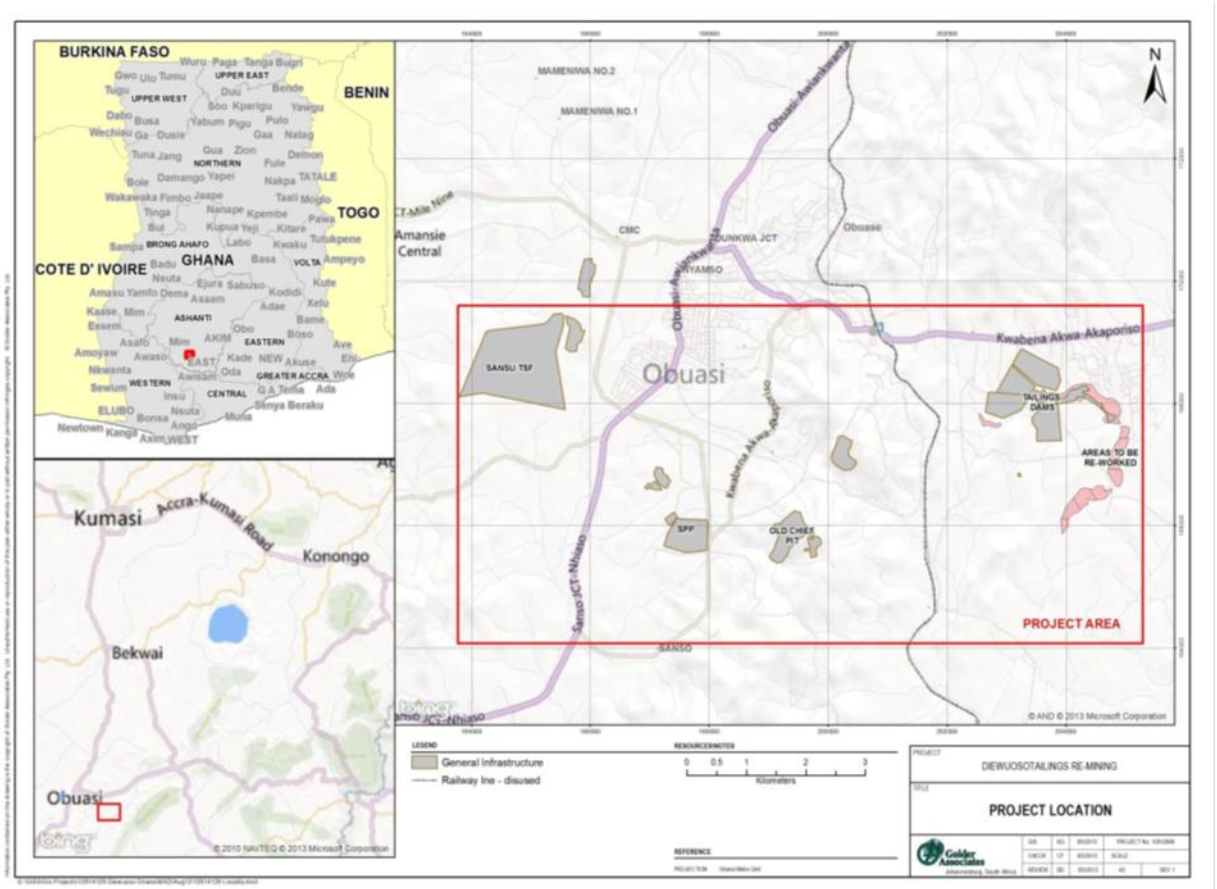

Figure showing Ashanti region

AngloGold Ashanti company boast of its cordial relationship with social institutions and leaders in African countries where it operates. The company has embarked on several developmental projects to serve the people in the communities where they operate. As far back as the 17th century, some powerful Ashanti states controlled the rich goldfields in the Ashanti region, presently called Ghana. In 1874, the British colonization of Ghana and the ensuing Ashanti wars brought a large number of Europeans to the area. As time went on, news about the regions' gold discovery were spread by soldiers and travelers--"you could pick up gold as you would pick potatoes," reported one traveler. The region became open to the production of gold in large-scale commercial quantities. The Ashanti protectorate was directly under the control of Britain and Edwin Cade was given the permission to commence mining operations in the region after the Ashanti king was overthrown in 1896. With the overthrow of the Ashanti king in 1896, the Ashanti protectorate was brought directly under British control, and Edwin Cade was given approval to mine the region. Cade on 11th June, 1897 the Ashanti Goldfields Corporation Ltd was recorded on the London Stock Exchange and operations started at Obuasi on 24th December, 1987. During the first year of mining operation the Obuasi mine managed to produce 2,544 ounces of gold and increased to 4,673 ounces in the second year. This early achievement, coupled with the devastation of the South African gold trade during the Boer War (1899-1902), led to the quick development of the Ashanti region that lasted until the revolt of the people of Ashanti in 1900 against British rule. After the war, Ashanti became a place of great virtue following the discovery of gold along the Obuasi fissure in 1937 and other locations.

Unfortunately, several mines in the Gold Coast region of Gold Coast were closed down during World War II which became a huge challenge to the whole mining industry in Africa. Consequently, investors who are from foreign countries had been prevented investing into the industry since 1942, and countless mines were shut down for reasons of not been able to

continue with their operations. The Ashanti mine happened to be part of the remaining four that continued to operate in Gold Coast and was the leading and most profitable. During this time, Chairman General Sir Edward Spears was the ruler of Ashanti and he was resided abroad and rarely visited the company to monitor its operations. He was an autocratic leader. The company's first Ghanaian CEO, Sam Jonah was appointed in 1986. He worked tirelessly to improve upon the operations of the company. Even though the company's headquarters was located in Accra for twelve years, the consultants in the London office were responsible for most of the planning and budgeting. As a way of keeping the staff closer to the mine geographically, Jonah shifted these duties to Ghana. This brought about an improved communication system between management and line workers, mine workers' wages were increased, and the company started the community renewal plan that is now a hallmark of all its operations throughout Africa. In 2004 AGC merged with Anglo America, a South African gold mining company which has its Corporate Head Quarters in South Africa. After mergence, the new company adopted the name "AngloGold Ashanti. AGA employees are those employees who provide both direct and indirect services to the mainstream work flow of the organization. They include a wide range of core direct expert and support (non-core) services employees. These are the mining Engineers, Electrical, Mechanical, Geodetic, Instrumentation, Industrial Engineers, Surveyors, Accountants, Information Technologist, Administration, Metallurgists, Geology, Environmental, Training and Development, Medical Services, Public Relations Department, Human Resource Management, . These are the employees' categories that perform the activities in ensuring the effective and efficient performance of the organization.

The **vision** of AGA is "to be Leading Mining Company".

The **Mission** AGA states that "We create value for our shareholders, our employees and our business and social partners through safely and responsibly exploring, mining and marketing our

products. Our primary focus is gold and we will pursue value creating opportunities in other minerals where we can leverage our existing assets, skills and experience to enhance the delivery of value"

The **values** of AGA are six and have been stated as;

'Safety is our first value

We treat each other with dignity and respect

We are accountable for our action and deliver on our commitments

We value diversity

The communities and societies that we operate in shall be better off for AGA having been there

We respect the Environment'

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

4.0 Introduction

In the previous chapter, the methodology adopted for data collection and analysis was examined. In this chapter, the data collected is analyzed and discussed.

4.1 Risk Management Policy/Programme of AngloGold Ashanti, Obuasi Mine

The interviewee sought to investigate whether AngloGold Ashanti, Obuasi Mine has a laid down financial risk management policy/strategy. The Chief risk officer of AngloGold Ashanti, Obuasi Mine (Ghana) revealed that the company has a comprehensive risk management policy that guides the operations of the company. This policy has been drawn with the collaboration of management and the board of the company. The intention of the policy, the interview revealed, is to help management effectively manage the wide range of risks associated with mining operations. There is also an ongoing programme to evaluate and review risk management strategies of AngloGold Ashanti, Obuasi Mine. The interview further revealed that management of the company is answerable to the board and a system of internal controls has been instituted to manage significant risk. This system has been of much benefit as it helps the board in discharging responsibilities and ensuring the effective management of risk associated with the operations of the company in support of the goal to create and preserve shareholder wealth.

The interview also established that, in order to effectively manage the various risks confronting the company, its risk management policy/programmes should be modeled to meet the

requirements of the King Committee on Governance: Code of Governance Principles for South Africa (King III) and the United States Sarbanes-Oxley Act (SOX).

4.2 Reason for Risk Management Practices at AngloGold Ashanti, Obuasi Mine

Having established that the company has a comprehensive risk management policy guiding its operations, the researcher further sought to investigate the reason behind the risk management programme, especially financial risk management. The chief risk officer manager unequivocally stated that there are two main purposes informing the risk management policy of the company. The first is the maximization of shareholder worth. The second reason for managing risk is to protect the interest of key stakeholders, including managers of the company. This is in line with the assertion by Fatemi (2002) that risk management in most organisations is founded on two important theories. These are the shareholder value maximization theory and managerial risk aversion hypothesis. According to the author, the shareholder value maximization hypothesis predicts that a firm will engage in risk management policies if, and only if, they enhance the firm's value and thus its shareholders' value.

4.3 The Main Financial Risk Associated with the Operations of AngloGold Ashanti, Obuasi Mine

The interview conducted with the chief risk officer of AngloGold Ashanti's Obuasi Operations and other risk management officers revealed two main financial risks. These are commodity (Gold) Price Volatility and Foreign Exchange rate risk. For the purposes of this study, gold price volatility risk is analysed.

4.4 Commodity (Gold) Price Volatility

Companies who produce locally and export their produce to the international markets are faced with price volatility. That is, the prices of their export may fluctuate from the expected prices. Gold mining firms face significant exposure to gold price fluctuations; gold prices have experienced significant volatility. The interviewees admitted that commodity market price fluctuations can have serious adverse effect on the profitability of AngloGold Ashanti, Obuasi Mine's operations**.** AngloGold Ashanti, Obuasi Mine's generates its revenue basically from the sale of gold and, to a lesser extent, uranium and silver. These commodities market prices fluctuate generally. The interview revealed that the main causes of commodity price include: investors assuming speculative positions or traders in gold; Changes in the demand for gold as an investment; Changes in the demand for gold used in jewelry and for other industrial uses, including as a result of prevailing economic conditions; Changes in the supply of gold from production, disinvestment, scrap and hedging; Financial market expectations regarding the rate of inflation; Strength of the US dollar (the currency in which the gold price trades internationally) relative to other currencies; Changes in interest rates; and The cost of gold production in major gold producing countries.

The market price of gold has experienced significant volatility. The gold price traded from a high of $1,431 per ounce to a low of $1,044 per ounce during 2010. On 10 March 2011, the afternoon fixing price of gold on the London Bullion Market was $1,413.25 per ounce. The chief credit risk officer admitted that the company's ability to evaluate the feasibility of undertaking new capital projects or continuing existing operations or to make other long-term strategic decisions might be affected adversely by a sustained period of significant gold price volatility. He stated that "*if revenue from gold sales falls below the cost of production for an extended period,*

AngloGold Ashanti, Obuasi Mine may experience losses and be forced to change its dividend payment policies and/or curtail or suspend some or all of its capital projects and/or existing operations". Table 4.1 and Figure 4.1 depict changes in gold prices over the past 15 years. The volatility in gold price has become more pronounced in the past 5 years (See Figure 4.2). Gold recorded it highest price in 2012. However, 2013 and 2014 has seen unprecedented decline in the price of the commodity. For the first time in ten years, the metal recorded a decline in its average price.

Table 4.1 Gold prices Changes over the past 15 years.

Year	Price($per ounce)
2000	279.11
2001	271.04
2002	309.73
2003	363.38
2004	409.72
2005	444.74
2006	603.46
2007	695.39
2008	871.96
2009	972.35
2010	1,224.53
2011	1,571.52
2012	1657.51
2013	1,411.51
2014	1,220.00

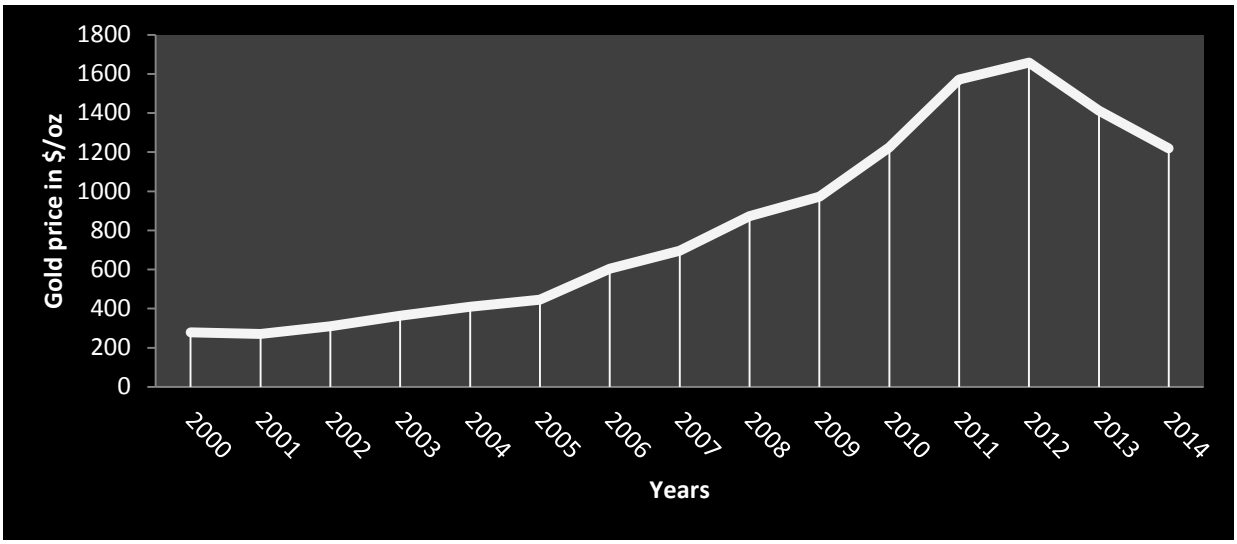

Figure 4.1 graph showing gold prices since movement over 15 years

Figure 4.2 Volatility in gold for the past 5 years.

After peaking at 1657 in 2012, the price of gold has witnessed downward trend from 2013 to mid-2014. This trend, according to some analysts, is expected to continue through 2014 and 2015. According to UBS Investment Research (2014) for instance, with few positive catalysts moving forward, "gold is unlikely to regain its former appeal". Consequently, the firm's2014 average gold price was cut from $1,325 an ounce to $1,200. The Bank of America was a little nicer to gold and predicted on December 15 that gold in 2014 will average $1,294 an ounce, rising from $1,250 in the first quarter to $1,350 in the fourth. However, the bank cautioned that further slides could occur if the U.S. central bank tightens monetary policy by raising interest rates — a factor that could push gold down to $1,100. In October 2013, Morgan Stanley also predicted that gold will extend losses in 2014 amid expectations of a further paring of U.S. stimulus — a prediction that proved prescient considering the $10 billion cut to Quantitative Easing (QE) announced on December 18, 2013. The investment bank said bullion will average $1,313 an ounce next year, compared to its 2013 forecast of $1,420, Morgan said in its quarterly metals report quoted by Bloomberg. The result predictions clearly show that gold price is less likely to revert to its bullish trend in the near future. This calls for an effective risk management policy to tackle the downward trend in the commodity's price.

4.5 Causes of the Current Decline in Gold prices

The interview also sought to find out the main causes of the current fall in gold prices from the perspective of the interviewee. It was revealed that there isn't one thing that is contributing to the downward spiral of gold price. Several factors have contributed to the fall in gold prices. These include lower global inflation, the rise in the US dollar and the economic recovery of the US. Usually when there is high inflation in the global economy, people deem it worthwhile to invest in commodities, particularly Gold. The driving force behind this demand is the fact that in

the times of high inflation, stock markets do not do well and therefore becomes safe to opt for Gold. However, the global economy in general and the US economy in particular are witnessing low inflation as a result of recoveries from the credit crunch.

Also, a decline in the US dollar leads to increases in the demand for gold and hence higher gold prices. Most investors believe that gold is a good hedge against declining dollar. However, the current rise in the value of the US dollar has led to a decline in gold demand, thereby forcing the price of gold to fall. Confidence in the US economy, which is the largest in the world, has also led to a fall in the demand for gold.

If there are lower real interest rates, then the returns on bonds, equities and real estate will not satisfactorily compensate for the risk and inflation. Hence, people will have the desire to invest in gold. However, the decision by the US Federal Reserve to scale back quantitative easing has led to a rise in interest rate and hence a fall in the demand for gold. For example, on the day after the announcement by the U.S. Federal Reserve that it will scale back quantitative easing, or QE, by $10 billion a month beginning in January, gold slipped below the $1,200 an ounce mark for the first time in 6 months, with the spot price trading around $1,196 in New York.

The interviewee stated that with these factors been put aside, gold prices are also been affected by speculation, human sentiment, the fear of the currency becoming worthless as a result of a national crisis, demand of jewellery etc. For instance when the world was shocked by Cyprus, and the gold market, by announcing it would sell its gold to finance a 400-million-euro bailout, and wind down underperforming banks — even signaling the government would go after the deposits of ordinary citizens. The effect on gold was severe, with the precious metal falling

below $1,500 for the first time in more than 18 months, as investors fretted over the prospect of other heavily indebted European nations doing the same.

4.6 Management of Gold Price Volatility Risk

One of the objectives of the study was to examine how and why gold price volatility risks are managed in AngloGold Ashanti, Obuasi Mine (Ghana). This objective was achieved by interviewing the chief risk officer of the company.

Gold prices has seen downward trend over the past two years. For instance, after reaching record highs in the first half of 2008, commodity and metal prices, collapsed spectacularly in the wake of the global financial crisis, losing nearly 50% by mid-2009. After picking up in 2010 and 2011, prices of gold since late 2012 have seen downward trend (See figure 4.1). The volatility in prices of gold and other forms of risks have the potential of disrupting the activities of mining firms. Against this backdrop, the researcher sought to identify the main strategies employed by AngloGold-Ashanti (Ghana) to manage this risk. The interview revealed that previously, the company was using hedging to manage volatility in gold pricing but has since abandoned the strategy. He further explained that the company announced the elimination of the last of its hedge book in October 2010. Prior to that period, the company had hedged 11.3 million ounces of gold, as of early 2008. However, the amount of gold hedged was gradually reduced to 3.22 million. In October 2010, this remaining amount was paid off (de-hedged) with US$2.63 billion, or US$1,300 per ounce of gold. According to him, the company periodically measure whether the hedges are effectively reducing it exposure, and since it has not been successful, the company refrained from managing this risk. Currently, the company does not have any tool for managing price volatility risk.

The lack of hedging policy by AngloGold Ashanti is not surprising. Hedging future production was common in 1990s. However, the practice became less common when gold entered into a decade-long bull run. In fact, mining companies spent billions of dollars to unwind hedged positions when gold prices surged in the era of easy monetary policy. For instance AngloGold Ashanti spent approximately US$2.63 billion in 2010 to unwind hedge positions. Also in 2009, Barrick Gold (NYSE: ABX) raised over $5 billion to unwind its hedge book in order to capitalize on rising gold prices. Since then, the company has maintained a no-hedge position, which is not surprising given that gold prices surged after 2009 as the Federal Reserve launched multiple bond purchase programs. Most mining firms do not also hedge because they believe that commodity price risk forms the basis of the firm's business activities, and is consequently a business risk that investors expect the firm to bear. This view appears to be consistent with that of other firms in primary industries. Millman (1990), for example, reporting the risk management practices of an oil company, noted similar views. Another reason why the company does not manage its price volatility risk may stem from the fact that historically gold prices have seen upward trends and therefore hedging may not be financially viable.

However, current price drops in international price of gold provides some reason for the company to employ tools such as hedging, insurance and forward contract to manage price changes. The rich menu of risk management instrument gives the company an ability to customize its gold exposure. Failure to do this may have serious consequences on the cash flow of the firm. For instance according to Tufano (1996), a drop in gold prices and cash flow could bring to a halt the major investment programmes of mining firms: exploration and acquisition. AngloGold Ashanti, Obuasi Mine (Ghana) is already experiencing serious difficulties as a result of the fall in gold prices over the past two years. According to the Ghana Mine Workers Union,

over 3,000 workers have been laid off by the country's mining companies due to a fall in the world market price for gold (Myjoyonline.com). This has brought untold hardship to the affected employees and the country as a whole.

Given the continuous fall in the price of gold, the interviewee further wanted to know whether the company intends to adopt some financial derivative instruments to hedge against the fall in gold prices. Though no concrete response was given, there is a likelihood that the company may return to hedge it downside if the current decline in gold prices continue through 2014 and 2015. This is in agreement with analysts at Thomson Reuters GFM (2012) who explain that gold producers will return to net hedging this year for the first time after 2011. However, Barclays' analysts wrote: "We do not expect a large-scale hedging of the magnitude seen during the 1990s." Then they wrote: "… But signs of fresh hedging have materialized." Hedging future production certainly has its benefits. It guarantees future cash flows, especially during a volatile period like the one seen in 2013 and 2014 when gold prices fell nearly 30%. However, it also limits the upside potential for mining companies when gold prices increase

4.7Challenges of Risk Management in AngloGold Ashanti

Implementing an effective risk management strategy or programme is not without challenges. These challenges may be classified as cultural, or having to do with attitudes and perceptions, rather than with the mechanisms of the implementation. The researcher, through the interview with the chief risk officer, sought to establish the main challenges confronting the AngloGold Ashanti, Obuasi Mine (Ghana) in managing its risks, especially price volatility risks. The findings revealed that lack of expertise in risk management is a major challenge facing the mining firm. He explained that understanding the various risk management instruments and

identifying when and how to apply them requires expertise in finance and economics. However, it was revealed that the company does not have enough experts in the field of risk management to effectively analyse the various risk exposures. Furthermore, it was revealed that uncertainties in the gold mining industry make it difficult to do proper forecasting to determine the movement in prices over time.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

The previous chapter presented the analysis and discussion of result obtained from AngloGold Ashanti, Obuasi Mine (Ghana). This chapter presents the summary of the findings, conclusion as well as recommendations for key stakeholders in the mining industry

5.1Summary of Findings

The interview reveals that AngloGold Ashanti, Obuasi Mine (Ghana) has a comprehensive risk management policy that guides the operations. This policy has been drawn with the collaboration of management and the board of the company. The intention of the policy, the interview revealed, is to help management effectively manage the wide range of risks associated with mining operations.

The study further reveals that there are two main purposes informing the risk management agenda of the company. The first is the maximization of shareholder worth. The second reason for managing risk is to protect the interest of key stakeholders, including managers of the company.

The main types of financial risks faced by AngloGold Ashanti, Obuasi Mine are commodity price volatility and foreign exchange rate risk. The study established that company refrains from managing the price volatility risk because its management has not been successful in improving the value of the firm in the past. The company announced the elimination of the last of its hedge book in October 2010. Prior to that period, the company had hedged 11.3 million ounces of gold, as of early 2008. However, the amount of gold hedged was gradually reduced to

3.22 million. In October 2010, this remaining amount was paid off (de-hedged) with US$2.63 billion, or US$1,300 per ounce of gold

The finding further reveals that inadequate expertise in risk management is a major challenge facing the mining firm.

5.2 Conclusion

In the mining industry, firms on regular basis are faced with financial risks that threaten the stability in their profitability and cash flows. These risks have been shown to arise as a consequence of volatility in the exchange rates, interest rates and commodity prices. Against this background, the study used a detailed, single case study of a large mining corporation to examine the management of corporate financial risk. Given the current volatility in gold prices, the study concentrated on the management of commodity price volatility in the mining industry and how it is managed. The use of the case study approach helped the researcher to gain much insight into the risk management practices of AngloGold Ashanti (Ghana). The study established that there is a comprehensive risk management policy guiding the operations of the mining firm. It was further revealed that the company embarks on risk management with the aim of improving the interest of shareholders and other important stakeholders. The study found that even though AngloGold Ashanti, Obuasi Mine is exposed to financial risk (price volatility risk), the company refrains from managing these risks due to their minimal impact on the firm's cash flows.

5.3 Recommendations

Based on the findings of the study, the following recommendations are made for key stakeholders in the mining industry. First, the study established that AngloGold Ashanti, Obuasi

Mine (Ghana) does not use any risk management tools for the management of gold price volatilities. Given the fact that gold prices have plummeted more than 25 percent in value; or 37 percent lower than gold's record high of $1,923.70 an ounce reached in September 2011, it is recommended that the company should take a second look at the current policy and introduce risk management techniques such as hedging to protect the cash flows of the firm.

Secondly, the study established that the company lacks adequate qualified personnel to effectively manage its risk exposures. It is recommended that more funds should be devoted to the recruitment and training of risk experts in order to improve the risk management practices of the company.

The study further recommends that futures studies should include all mining firms in Ghana in order to obtain a more comprehensive and comparative analysis and result.

REFERENCES

Akabzaa, T., and Darimani, A. (2001). Impact of Mining Sector Investment in Ghana: A Study of the Tarkwa Mining Region", Draft Report Prepared for SAPRI.

Asiamoney, D (2001). Risking Value by Hedging Translation Exposure, pp. 79–90.

Belk, P., Edelshain, D., (1997). Foreign exchange risk management—the paradox. Managerial Finance, 5–24.

Babbie, E. (2010) The *Basics of Social Research, 4rd ed. Belmont*. CA, USA: Wadsworth.

Belk, P., Glaum, M., (1992). Financial innovations: some evidence from the UK. Managerial Finance, 71–85

Bodie, Z., Merton, R.C., (2000). Finance.Prentice-Hall, Upper Saddle River, NJ.

Busha, C. H., and Harter, P. H., (1980).Research Methods in Librarianship: Techniques and Interpretation. Orlando, FL: Academic Press, Inc.

Campbell, B. (2003). "The challenges of development, mining codes in Africa, and corporate responsibility." International and Comparative Mineral Law and Policy Trends and Prospects, 4-6.

Carpenter, J. (2000), Does option compensation increase managerial risk appetite?,*The Journal of Finance* 55, 2311-2331.

Cohen, L., Manion, L., & Morrison K. (2000).*Research Methods in Education* (5th Edition).

Dhanani, A., Groves, R., (2001). The management of strategic exchange risk: evidence from corporate practices. Accounting and Business Research, 275–290

Fatemi, A. and Glaum, M. (2000), "Risk management practices in German firms". *Journal of Management Finance*, Vol. 26, no.3, pp 1-17.

Froot, K., Scharfstein,D. and Stein, J. (1993), "Risk Management, Coordinating Corporate Investment, and Financing Policies," Journal of Finance 48, 1,629-1,658.

Ghana Chamber of Mines, (1998). Annual chamber of mines report: Accra, Ghana.

INCOSE International Symposium (1995) Complex System Product Development: Adding Value by Creating Information and Reducing Risk,

INCOSE International Symposium (2002) Denver International Airport: How could System Engineering Principles Have Prevented Disaster?, Cook, R.H., Proceedings

Jorion, P. (1997). Value at risk. Chicago, IL: Irwin.

Jorion, P., (1990). The exchange rate exposure of U.S. multinationals. Journal of Business 63, 331–345.

Kesse, G. O. (1985). The Mineral and Rock Resources of Ghana. Journal of African Earth Sciences, 7, 601-610.

Lee, F., Marshall, A., Szto, Y., Tang, J., (2001). The practice of financial risk management: an international comparison. Thunderbird International Business Review, 365–378.

Lessard, D., (1989). Corporate finance in the 1990simplications of a changing competitive and financial context. Journal of International Financial Management and Accounting, 209–231.

Merriam, B. S. (1998). Qualitative Research and Case Study Applications in Education. San Francisco Jossey-Bass Publishers Inc, pp. 23-33

Merton, R. , (1993), Operation and regulation in financial intermediation: A functional perspective, in Peter Englund, Ed.: Operation and Regulation of Financial Markets (EkonomiskaRadet, Stockholm).

Miles, M., Huberman, A., (1994).Qualitative Data Analysis, 2nd ed., Sage Publications, London.

Morellec, E. and Smith, J.C. (2002), Investment policy, financial policies, and the control of the agency conflicts, *Working paper* No FR 02-16, The Bradley Policy Research Center.

Rodriguez, R., (1980). Foreign Exchange Management in Multinationals, Lexington Books, Lexington, MA.

Saunders, M., Lewis, P. and Thornhill, A. (2009), Research Method for business students. Pearson education limited Harlow: England, pp. 129-168

Shapiro, A. C., and Titman,S.(1986), An integrated approach to corporate risk manage-ment, in Joel Stern and Donald Chew, Eds.: The Revolution in Corporate Finance (Basil Blackwell, Ltd. Oxford, England and Basil Blackwell, Inc., Cambridge, Mass.

Sinkey, J. F. (2002), Commercial Bank and Financial in the Financial-Services Industry, Prentice Hal

Spedding, L. and Rose, A. (2008). Business Risk Management Handbook: A Sustainable Approach. 1st Edition. Elsevier Ltd. Burlington, USA

.

Srinivasulu, S., (1983).Clarifying foreign currency exposure. Financial Executive, 36–44.

Stulz, René (1996), "Rethinking Risk Management," Journal of Applied Corporate Finance 9, 3, 8-24.

Trochim, W.M.K (2005). Research Methods, The concise Knowledge base, Atomig Dog Publications, Califonia, U.S.A

Tufano, P. (2003). Financial innovation: The Handbook of the Economics of Finance. *Elsevier,* Vol 1, No, 1, pp. 307–335

Tufano, P. (1996), "Who Manages Risk? An Empirical Examination of Risk Management Practices in the Gold Mining Industry," Journal of Finance, September, 1,097-1,137.

Tufano, Peter, and Jon Serbin, 1993, American Barrick Resources Corporation: Managing gold price risk, Harvard Business School, Case number 293-128

Watson D. and Head A. (2009). *Corporate Finance: Principles and Practice.* 4th Edition Prentice Hall.Financial Times. pp 267-272

Werner, S., Brouthers, L., Brouthers, K., (1996). International risk and perceived environmental uncertainty: the dimensionality and internal consistency of Miller's measure. Journal of International Business Studies, 571–592.

Yin, R. K. (2003).*Case study research: Design and methods* (3rd ed.), Thousand Oaks, CA: Sage..

Yin, R., 1994. Case Study Research: Design and Methods, Sage Publications, London

Zikmund, W. (2000), Business Research Methods, 7th ed., Thomson/South-Western, Mason, pp.86-94

APPENDIX A – Research Instrument

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

KNUST SCHOOL OF BUSINESS

Dear Respondent,

An academic research is being conducted to *examine the risk management practices in the mining industry of Ghana*. Your company has been chosen as the case study Organisation. You can contribute to make this study a success by providing responses to the questions in this instrument. All information you provide will be treated confidentially and shall be used for academic purposes only.

Thank you.

INTERVIEW GUIDE

Background Information

2. Position ----------

3 Work experience with the organisations ----------

5 Why does your firm manage risk, especially financial risks?

……
……
……
……
……

3. Can you please describe the risk management practices in your outfit?

……
……
……
……
……

4. How does your firm generally manage financial risk (foreign exchange risk, interest rate risk, Commodity price volatility risk?)

……
……
……
……
……

5 Is financial risk a major consideration for your risk management strategies?

……
……
……
……
……

6 Is there a laid down policy on risk management in AngloGold Ashanti (Ghana)

……
……
……
……
……

7. If there is a risk management policy, can you please explain what it entails?

……
……
……
……
……

8. To what extent is gold price volatility a major risk factor?

……
……
……
……
……

9. Which financial derivative instruments are used to manage risk?

……
……
……
……
……

10. Does the company use options to manage gold price volatility risk? If yes, what has been the success rate?

……
……
……
……
……

Please indicate the extent to which the following risk management tools are used in your outfit

Tools	**Frequently used**	**Used occasionally**	**Hardly use**
Hedging			
Diversification			
Insurance			

11. Over the year, there have been concerns about gold price volatility. How is such risk being managed in your outfit?

……
……
……
……
……

12. Are the financial risk management practices in the mining firm yielding required results?

……
……
……
……
……

13. What are the challenges you encounter in managing risk in the Organisation

……
……
……
……
……

14. Are these challenges affecting the operations of the firm?

……
……
……
……
……

15. If the answer is yes, in what ways

……
……
……
……
……