Chapter 2: Literature study

2.1 Platinum mining in South Africa

2.1.1 Platinum overview

General description

Platinum is a greyish to silver white metal with a high density ($22g/cm^3$, which is heavier than gold). According to its material safety data sheet (www.sciencelab.com) it is a stable material with low reactivity. Platinum is grouped into a few families of metals namely: precious metals, noble metals and Platinum Group metals.

- Precious metals are scarce metals with a high monetary value. High grade platinum ore only has up to 3.5g of platinum for every 1000 kg of ore that is mined (Jones, 2006:7). Figure 2.2 indicates the high monetary value of this metal (roughly R400, 000/kg).

- Platinum Group metals (PGM's) consist of 6 rare and chemically similar elements. Platinum, iridium and osmium are grouped into a heavier category while palladium, rhodium and ruthenium form the lighter group. These metals share the same characteristics, which include: catalytic qualities, chemical inertness, resistance to corrosion and high melting temperatures (Conradie, 2007:1).

- Noble metals usually include the PGM's as well as Gold and Silver, as it has a high resistance to oxidation and corrosion. Platinum is a precious metal, which means that it is rare and usually with a high monetary value (Jones, 2006:2).

History

The word platinum is derived from the word "platina", which means "little silver" in Spanish. This metal was first discovered in nuggets while mining for silver in the current country of Colombia over 400 years ago. It was named as such as it was believed to be inferior to silver (Jones, 2006:2).

Early scientists found it difficult to understand the properties of the metal due to the fact that it was chemically stable and had a very high melting point. In 1751 a

Swedish researcher named Sheffer succeeded in melting platinum by using arsenic. During the 19th century platinum was used in its pure form, and its catalytic properties were only discovered by Grove in 1942. The first successful techniques for separating and refining platinum group metals were developed by Percival Norton Johnson and George Matthey (This partnership has grown into the world renowned platinum group *Johnson Matthey*).

Platinum was discovered in Canada in 1888 and the country became the world's premier source of platinum until after World War II. In 1924 platinum was discovered in the Transvaal province of South Africa, and it has since become the Mecca for world platinum production. (Anond, 2010)

Uses and Applications

According to Platinum Today, the world's leading authority on platinum group metals (an affiliate of Johnson Matthey, www.platinum.matthey.com/applications), the different uses and application for platinum are as follows:

Auto catalysts: Platinum, palladium and rhodium are used in various combinations to be used as a three-way catalytic converter. These converters simultaneously remove carbon monoxide, hydrocarbons as well as nitrous oxides from exhaust emissions.

Jewellery: Platinum jewellery has become more and more popular in all markets, but it is mainly driven by Asian markets (*See 2.1.2 Platinum and the market*). Jewellery applications for platinum are similar to that of gold. The earliest form of platinum jewellery is found on the famous Casket of Thebes, dated 700BC.

Other industrial products: Platinum is used in a wide variety of other industrial applications, which include: Chemical catalysts, electronics, medical applications and other non-catalytic automotive applications. These products are responsible for roughly 25% of the total worldwide platinum demand (Jollie, 2010:5). A more detailed review of these products is given in Appendix 1: Platinum.

2.1.2 Platinum and the market

Supply and demand overview

The total demand for platinum has been on the rise for the last 30 years. Demand for platinum was mainly driven by increasingly strict environmental laws in North
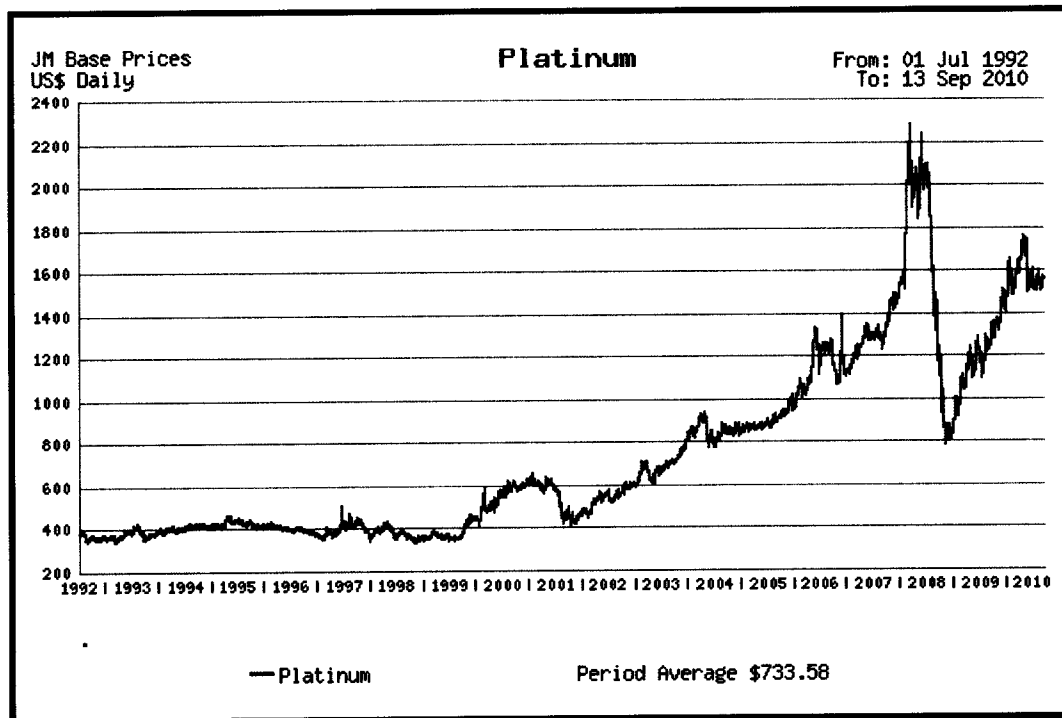
America and Europe. Legislation in the 70's forced car manufacturers to use PGM's in catalysts for less toxic exhaust emissions (Jollie, 2010:5). During the period 1975 to 1998 the supply usually met the demand, but from 1999 the demand increased to more than what the supply chain could deliver (Fig 2.1). These effects can be seen in the monthly average platinum price ($/oz) during the period 1992 – 2009 (Fig. 2.2). The platinum price was fairly constant during the 1990's, hovering around the $400/oz level. For the period 2000 – 2007 platinum prices increased fourfold, mainly driven by an economic boom. The impact of the economic recession in 2008 can clearly be seen by the massive correction in platinum prices, falling from levels of $2000 to below $1000 in a matter of months.

Fig. 2.1: Platinum: Annual supply and demand
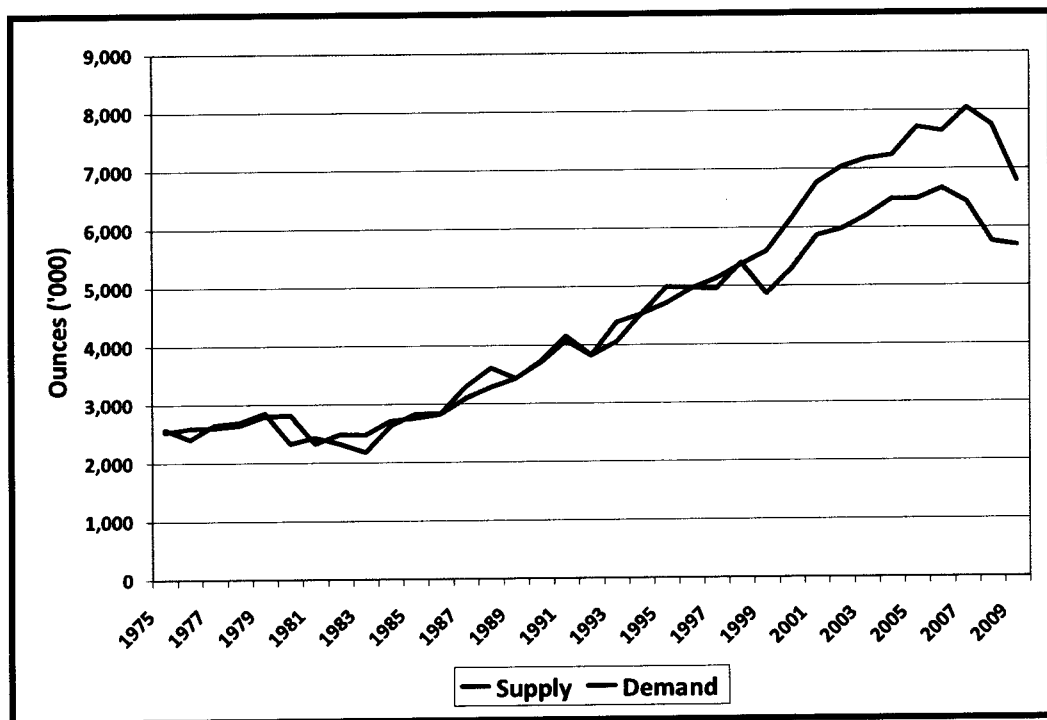
Source: Researcher's own compilation with data from Johnson Matthey

Fig. 2.2 Platinum market price over past 20 years

JM Base Prices
US$ Daily

Platinum

From: 01 Jul 1992
To: 13 Sep 2010

— Platinum   Period Average $733.58

Source: Johnson Matthey

Auto catalysts

As from 1974 when the USA enforced stricter environmental legislation, the demand for PGM catalysts saw a dramatic and steady increase. Auto catalysts represent 45 – 50% of total platinum demand for the period prior the 2008 recession (Jollie, 2010:5).

The global recession in 2008 with spending replaced by saving and less risk taking, banks more reluctant to approve credit and overall negative market sentiment, light duty vehicle manufacturing saw a huge decrease. In 2009 alone the total world light duty manufacturing decreased by 12.2% (Jollie, 2010:6). Demand for platinum decreased even further as car manufacturers went into a de-stocking process in order to reduce working capital. Total auto catalyst demands for 2009 were 46% less than that of 2007 (Fig. 2.3).

Figure 2.3: Supply and demand data for platinum 2007-2009

Platinum Supply and Demand '000 oz			
Supply	**2007**	**2008**	**2009**
South Africa	5,070	4,515	4,530
Russia	915	805	785
Others	615	620	605
Total Supply	6,600	5,940	5,920
Gross Demand			
Autocatalyst	4,145	3,655	2,230
Jewellery	2,110	2,060	3,010
Investment	170	555	660
Others	1,845	1,720	1,140
Total Gross Demand	8,270	7,990	7,040
Recycling	(1,590)	(1,830)	(1,405)
Total Net Demand	6,680	6,160	5,635
Movements in Stocks	(80)	(220)	285

Source: Jollie, 2010:7

Jewellery

During 2009 the demand for platinum jewellery increased by 46%, which is significant due to the fact that total platinum demand decreased by 11% (Jollie, 2010:5). The total demand for platinum used in jewellery was, for the first time, more than that of platinum used for auto catalysts. This rapid increase in demand is fuelled by the Chinese market, which had a total demand of 2.08 million ounces for the period, occupying two thirds of the world demand. More significantly is the fact that Chinese demand in this sector more than doubled from the 2008 figures. In the same period demands in North America and Europe decreased by 10% and 34% respectively (Jollie, 2010:29). The mechanism for this drastic increase in Chinese demand is explained by a few economic forces.

Firstly, a consumer-pull effect was generated due to the healthy state of the Chinese economy, which aided in the feel-good mentality of consumers. The fact that the bullion price for platinum dropped since mid–2008 also led to cheaper jewellery processes, which fuelled demand even more. Another impact of the

recession was the increase in the gold price as investors were seeking safe havens. This meant that the price difference between gold and platinum became smaller than usual, which gave consumers more options for buying platinum products without paying more (Jollie, 2010:34).

Secondly, a manufacturer-push effect was created by retailers and wholesalers who opted to increase stock levels in an increasing consumer demand cycle, as well as a slump in the platinum price (Jollie, 2010:35).

ETF

An Exchange-traded fund (ETF) is bought and sold like company stock. Individual investors acquire their stock as part of a larger block of stocks owned by an "authorized participant". ETF's shares are traded continuously during the normal daily running of a stock exchange (Ferri, 2009:26). Platinum ETF's allow investors to buy platinum stock. This stock is based on current market price and a certain value of stock can be purchased and later sold to a buyer at a higher price based on the platinum spot market price at the time. New platinum ETF's in the United States and a possible South African ETF could further increase trading of the PGM commodities, which could boost the price even further. According to Mr. Pine Pienaar (2010), CEO of Bauba Platinum, such newly established ETF's is one of the main driving forces behind the quick recovery of platinum demand after the original slump in 2008.

Future platinum demand

Most market players have consensus that the demand for platinum would increase in the near future. This demand would be driven by:

- Continued growth in the Chinese car and jewellery market
- Recovery in the US and European car markets
- Increased environmental legislation on car emissions in first and third world countries
- Establishment of more ETF's

According to Matthew Turner (2010), production of platinum would continue to lag demand which would push the platinum price steadily towards pre-recession values. With current technologies and market prices, mining companies will be able to mine profitably even at depths up to 1400m (Pienaar, 2010).

2.1.3 Platinum in South Africa

Bushveld Complex

In 1924, Dr. Hans Merensky and Andries Lombaard discovered a platinum containing ore body near Steelpoort in the Northern Province of South Africa. This was subsequently called the Merensky reef. In 1925 Merensky identified another promising occurrence near Mokopane (Potgietersrus), which was called Platreef and was the site for platinum ore mining and refining. Operations in this area were short-lived and after Merensky found another extension of the Merensky reef located in the Britz–Rustenburg area, it became the sole provider of platinum for the next 60 years (Cawthorn, 1999:481). Since the 1970's the so called Upper Group 2 Chromitite layer (UG2) has become the biggest identified platinum reserve. The Merensky reef and UG2 layers stretch over a length of 300 km in two separate arcs whilst the Platreef extends over 30km (Fig. 2.4). The Bushveld Complex has since become the largest source of PGM reserves in the world.

Fig. 2.4: The Bushveld complex: Merensky, UG2 and Platreef
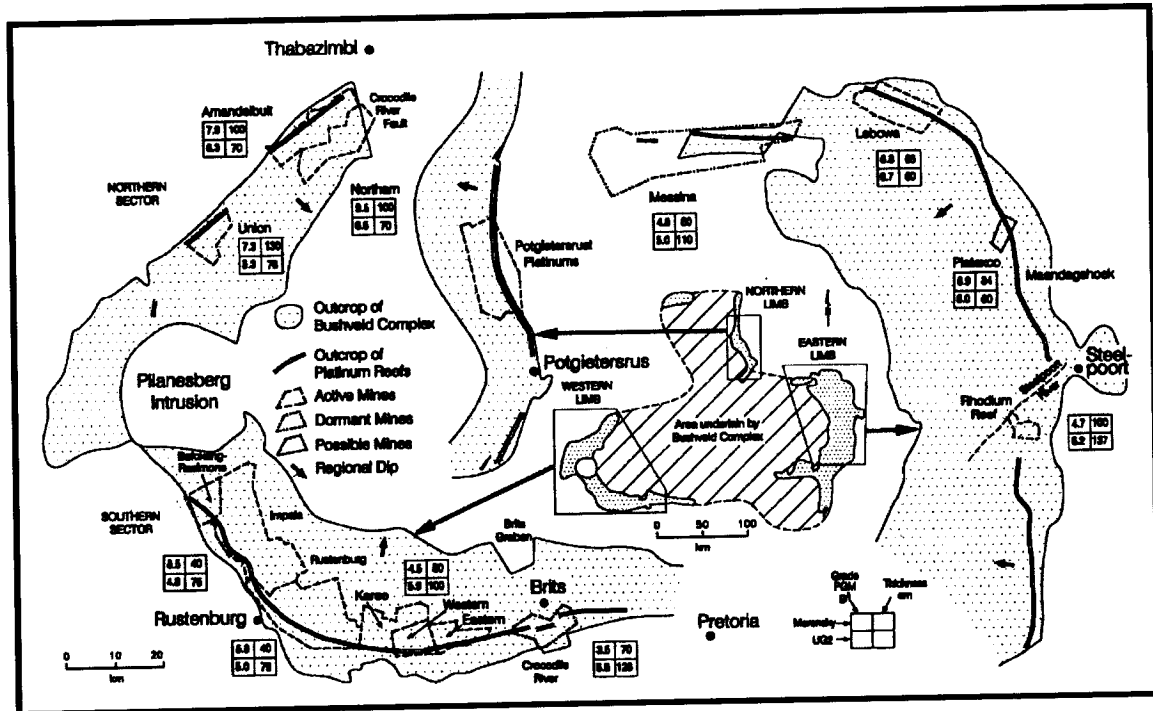
Source: Cawthorn, 1999:482

Fig. 2.5: PGM grades of different reefs in the Bushveld complex

Region	Pt grade (g t⁻¹)	Pd grade (g t⁻¹)	Pt (10⁶ oz)	Pd (10⁶ oz)	Pt grade (g t⁻¹)	Pd grade (g t⁻¹)	Pt (10⁶ oz)	Pd (10⁶ oz)
	Von Gruenewaldt[8]				Vermaak[9]			
Platreef	1.3	1.4	123	135	1.8	2.0	59	66
Eastern Bushveld								
Merensky Reef	3.2	1.4	134	57	2.4	1.4	146	83
UG2 Chromitite	2.4	2.0	153	127	1.8	1.6	153	137
Western Bushveld (north of Pilanesberg)								
Merensky Reef	3.2	1.4	44	19	3.2	1.5	35	15
UG2 Chromitite	2.4	2.0	51	42	2.1	1.0	33	16
Western Bushveld (southeast of Pilanesberg)								
Merensky Reef	3.2	1.4	77	33	2.5	1.2	164	82
UG2 Chromitite	2.4	2.0	115	95	2.1	1.0	183	84
Totals			698	508			773	484

Source: Cawthorn, 1999:483

According to the United States Geological Survey, South Africa holds 88.7% of world's known reserves of PGM's (Table 2.1)

Table 2.1: World reserves of PGM's

| Country	Reserve		
	t	%	Rank
South Africa	63000.00	88.73%	1
Russia	6200.00	8.73%	2
Zimbabwe	4800.00	6.76%	3
USA	900.00	1.27%	4
Canada	310.00	0.44%	5
Other	800.00	1.13%	
TOTAL	71000.00		

Source: United States Geological Survey, 2009

Platinum mining and the South African Economy

According to Department of Minerals and Energy (Mwape *et al.*, 2008:8), the South African mining industry has contributed between seven and eight percent of the countries total GDP over the past 10 years with a total value of R135.6 billion. According to Statistics South Africa, the total sales contribution of PGM's to the total South African mineral sales in 2007 is 35%. This is the largest contribution of a single mineral group and roughly translates to a 2.6% contribution to the country's GDP.

Statistics provided by the DME indicates that the PGM sector employs 37.6% of the roughly 495 000 direct workers employed by the South African mining industry. This is the largest sector contribution, with gold coming in at second with 34.1% (Fig. 2.6).

## Fig. 2.6: SA mining industry: Employment by sector

Employment by sector

Diamonds, 4%
Other, 12.10%
Gold, 34.10%
PGM's, 37.60%
Coal, 12.20%
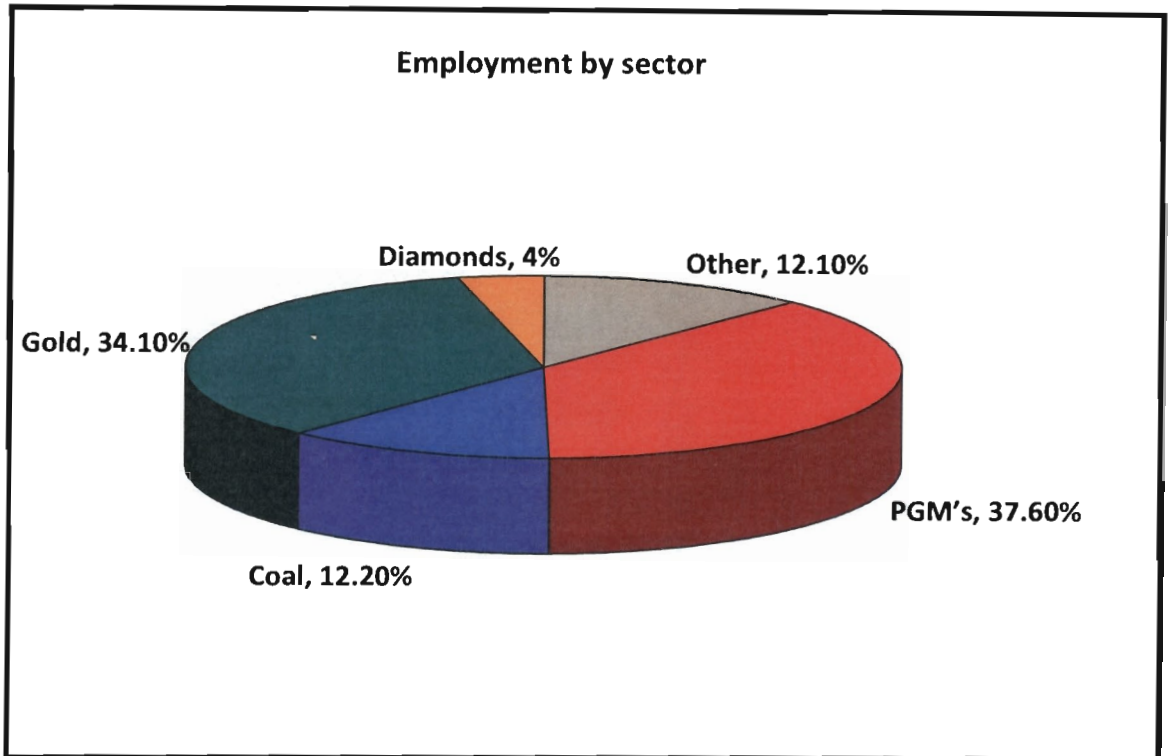
Source: Researcher's own compilation, data provided by DME

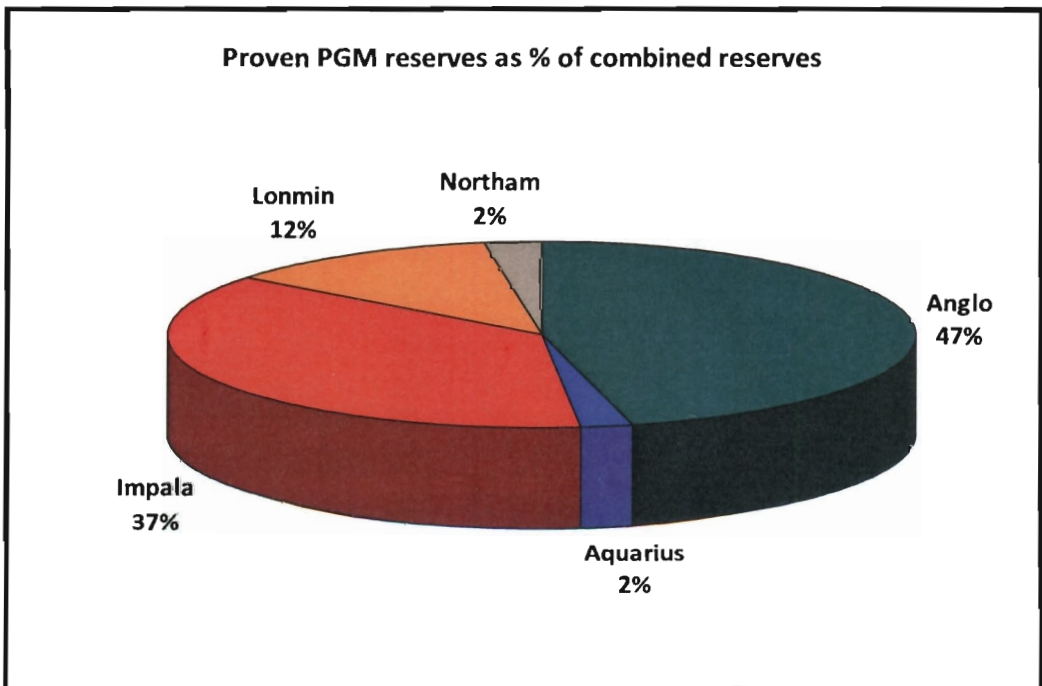## 2.2 Overview of identified platinum companies

2.2.1 Introduction

This study will focus on the five largest platinum producers in South Africa namely: Anglo Platinum, Impala Platinum, Lonmin, Aquarius Platinum and Northam Platinum. Other smaller South African platinum companies includes: Jubilee platinum, Wesizwe, African Rainbow Minerals, Anooraq Resources, Eastplats and Platmin. The total PGM reserves as well as 2009 production for these companies are given in Fig. 2.7 & 2.8.

Fig. 2.7: Production share as % of combined production 2009

Production share as % of combined production 2009

Northam
6%

Lonmin
12%

Anglo
44%

Impala
30%

Aquarius
8%
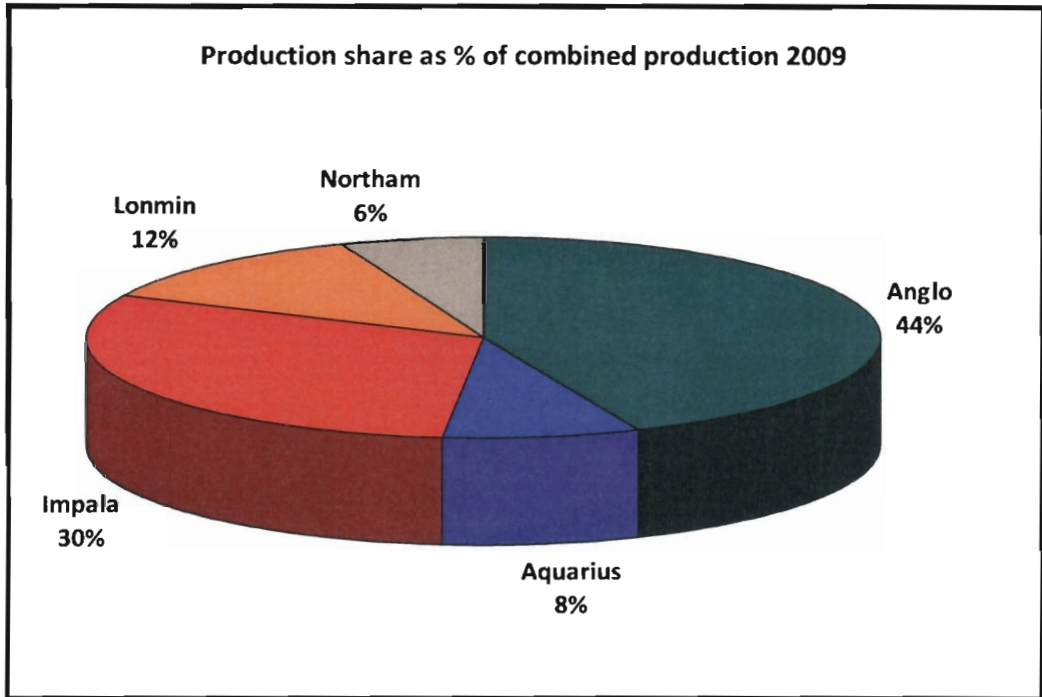
Fig 2.8: Proven PGM reserves as % of combined reserves

Proven PGM reserves as % of combined reserves

Northam
2%

Lonmin
12%

Anglo
47%

Impala
37%

Aquarius
2%

From the values in Fig.2.7 & 2.8, one can quickly deduct that these companies have a total reserve capacity that will sustain their current operations for another 65 years. Assuming platinum demand stays at current levels and with exploration as well as mining and refining technologies to improve, this life-of-mine period could be closer to 100 years. The four biggest companies in South Africa (Anglo, Impala, Lonmin and Aquarius) are also the four biggest platinum companies in the world. Figure 2.9 shows the locations of some of the different Platinum mining operations in South Africa, clearly indicating the western limb, eastern limb and Platreef.

Fig. 2.9: Locations of PGM mining operations in South Africa
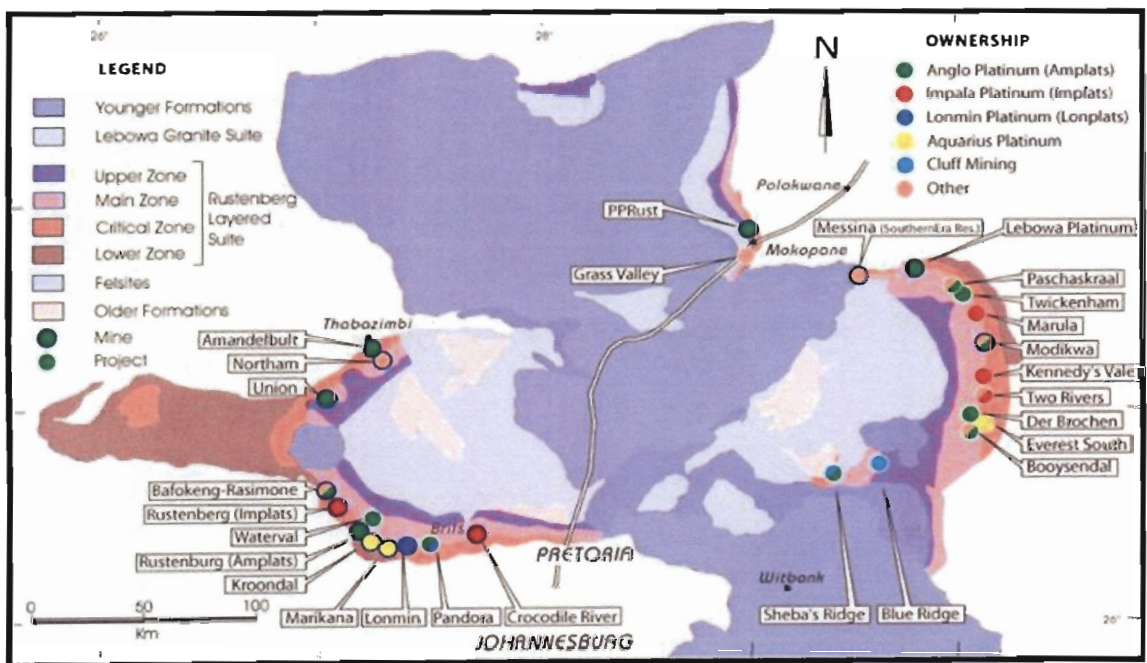
Source: www.blackthornresources.com.au

2.2.2 Review of identified companies

Appendix 2 offers a detailed review of the five identified platinum companies. The review briefly explains the companies' operations, mission, vision and other strategic and ethical aspects.

2.2.3 BBBEE

The Broad-Based Black Economic Empowerment Act of 2003 aims to rectify the employment and ownership imbalances that exist in South Africa due to pre-1994 Apartheid policies. It aims to expedite the participation of previously disadvantaged citizens in the economy of South Africa. In line with the BBBEE Act of 2003, the mineral and resource government sector has set out black ownership targets for the mining industry in general. In June 2010 Susan Shabangu (Minister of Mines) reconfirmed the targets set in the 2004 mining charter of having 15% black ownership of mines in 2009 and a 26% ownership by 2014 (Lourens, 2010:1). These targets pose a unique situation that mining companies in South Africa have to take into account when making strategic decisions.

Although equal economic participation would eventually produce an optimal competitive environment for the South African economy, the fast tracking of employment equity (employing more black people) and the selling of mining assets to black partners can have a negative effect on shareholder value if not managed properly. The Royal Bafokeng community owns massive parts of land on the western limb of the Bushveld complex, which holds large amounts of platinum reserves. Some of the platinum companies have opted to go into a share agreement with the Royal Bafokeng nation in order to obtain mineral rights for these ore reserves, and at the same time improve their overall black ownership status. Other BBBEE transactions include strategic ownership deals with black owned companies like Mvelaphanda Resources and African Rainbow Minerals. These strategic ownership deals can have a major impact on shareholder growth on the short as well as long term, and should be done based on strategic and well planned views.

2.2.4 Summary

Summary of overviews, operations and strategic objectives:

- It is clear that all the companies have as their main focus area of operations the Bushveld complex of South Africa. All five companies have operations in the western limb of the complex, whilst all companies either have or are

in the process of developing operations in the eastern limb of the Bushveld complex.

- Three companies namely Anglo, Aquarius and Impala have operations in Zimbabwe.
- All companies have some joint venture operations with the main allegiances being Anglo-Northam, Anglo-Lonmin and Impala-Aquarius. Joint ventures with other smaller role players is also being undertaken.
- Most of the companies are focussed on growth, which indicates a collective view of an increase in future demand.
- All companies place the safety and health of employees as their first value while most also value the protection of the environment.
- Ethical behaviour is amongst the main values in each company.
- The two biggest companies, Anglo and Impala, want to be the best platinum producer in the world.

2.3 Recession

2.3.1 General

A business cycle is a common economic phenomenon whereby recurrent ups and downs in the level of economic prosperity and activity occur over several years (Carbaugh, 2007:258). These continuous cycles are graphically represented in Fig. 2.10. The four stages in a business cycle are explained as follows (Carbaugh, 2007:260):

- Peak: At the peak of a business cycle, total gross domestic product (GDP) is at a temporary high with profits, economic prosperity and employment at high levels.
- Recession: A period of decline in production, profits, income, employment and trade. A recession can last from as little as 6 months to years (a prolonged recession is called a depression). A recession ends in a trough where decline smoothes out. The technical definition of a recession is when there is a decline in GDP for two consecutive quarters.

- Trough: The lower turning point of GDP. Unemployment and income are at its lowest levels.
- Recovery: The up turn in economic activity with increase in production, profits and employment reaching maximum levels

Fig. 2.10: Business cycle: Contraction and expansion
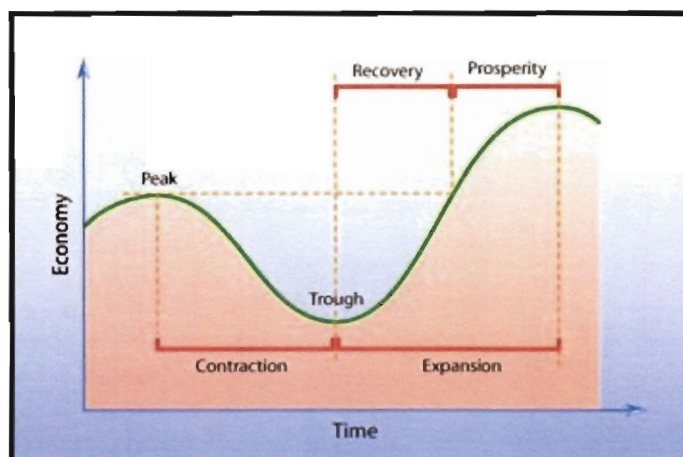
Business cycles are measured from peak to peak, and in the case of the United States of America these cycles are between 4 and 5 years on average. Carbaugh (2007:262) states that business cycles are mainly caused by increases and decreases in spending. An increase in spending means an increase in profits, but also an increase in inflation as prices are driven upwards by demand. At some point, the rate of spending decreases with lowering profits and a recession starts. Calitz (2009:2) explains that business cycles are mainly caused by an excess in demand (recovery) and an excess in supply (recession). An excess in demand and spending can be caused by many economic phenomena. For example, the technological development of the 1990's saw the longest post-World War II increase in GDP. Consumer demand for computer and other communication related products drove production and profit levels to an all time high.

Reasons for a decrease in spending and over-supply are usually caused by an overshoot in financial markets in the form of a so-called price bubble. The South African stock market crash in 1969 is such an example (Calitz, 2007:2). War times have also proven to cause a halt in spending and trigger recessionary periods

(Carbaugh, 2007:262). The devastating Indian Ocean tsunami in 2004 triggered a recessionary period in Phuket (Thailand) as tourism, the main source of income for the region, was disrupted for months. According to Economics Help (ANONb, 2009) a recessionary period is distinguished by:

- Increase in saving due to nervous perceptions of the market.
- Decrease in investment due to the lack of confidence by banks and other financial institutions.
- Decrease in consumption due to the fact the people are worse off (lay offs, reduced working hours, no pay increases).
- Government spending increases in order to simulate economic activity. This will in turn lead to higher debt and ultimately to higher tax rates.

2.3.2 Current economic recession

Background

"We start 2009 in the midst of a crisis unlike any we have seen in our lifetime"

- Barack Obama -

The current economic recession is the biggest economic slump since the Great Depression in the 1930's (Calitz, 2009:1). Calitz (2009:4) explains three developments that caused the current recession:

- The extension of loans was awarded to high risk borrowers with low job and income security. These people were sub-prime clients that could not meet their commitments to financial institutions. This type of lending is fine as long as house prices increase. In the 1990's and early 2000's house prices increased enough to stay above increasing mortgage values, and house owner's net wealth therefore increased. Banks were not concerned about payment default as they would sell the house at a profit.
- The lenient monetary policy of the USA artificially enhanced consumer demand. This was mainly done to stimulate economic activity after the recession in 2000 and also to instil confidence in the economy after the September 11 attacks. With the economic boom inflation levels started to rise at alarming levels and the economy required a tightening of monetary policy. As interest rates increased from 2004, house bond payments

started to increase, which dampened the growth in property prices. Defaults became more and more common and the balance sheets of banks and other financial institutions came under pressure.

- Financial derivatives created on the back of mortgage-backed securities (MBS). Banks consolidated housing mortgages and sold derivative financial instruments. These derivatives bought by investors in other countries were at the end of the day dependent on house owners in the USA to pay their home loans.

### 2.3.3 Impact of current recession

Figures 2.11 – 2.12 show how the recession had a different impact on the global South African GDP (Gross domestic product) than it had on mining in general. The South African GDP had a strong positive growth period leading up to the end of 2008. In 2009 the recessionary period caused a period of negative growth, but from the end of 2009 positive growth continued. The mining industry already experienced negative growth from the end of 2007 with a total decline of 12.2% from Q4 2007 to Q2 2010. This emphasizes the enhanced influence of recessions on the demand for natural resources. Other sectors like the commercial sector are not as vulnerable as people still have to fulfil their basic needs and live an everyday life. The demand for minerals and metals are usually synonymous with growth periods as it is either used to build infrastructure or as precious metals from a higher consumer demand.

Fig. 2.11: South African quarterly GDP

South African quarterly GDP at market prices
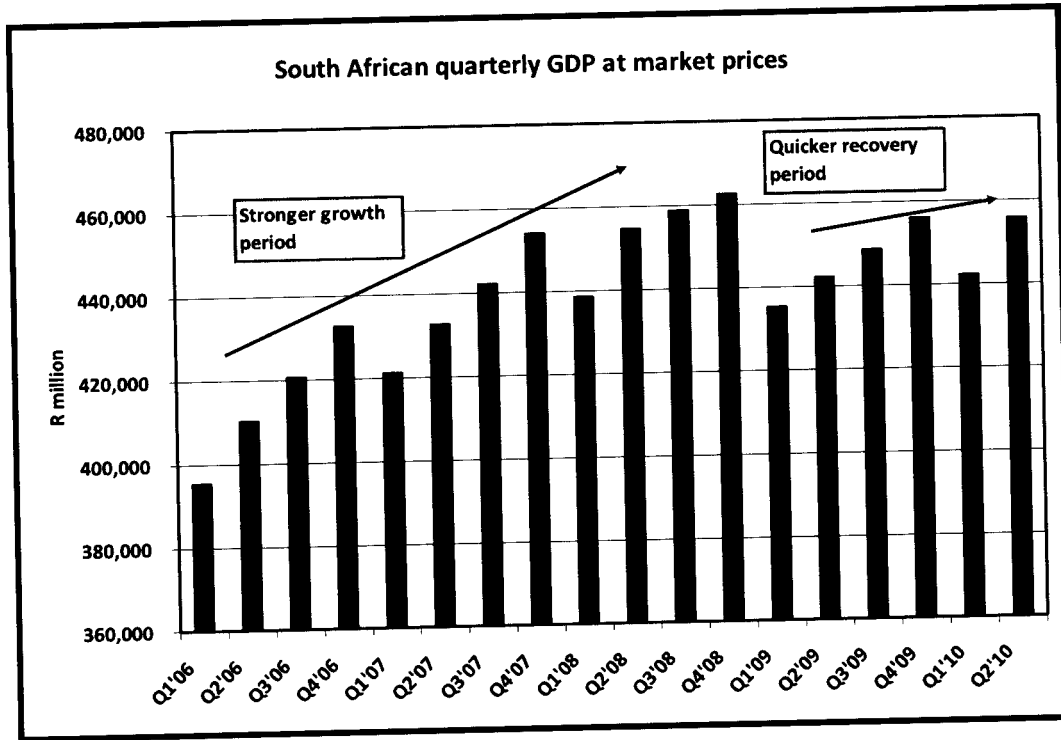
Source: Researcher's own compilation (Data: StatsSA)

Fig. 2.12: Impact of the recession on the mining sector GDP

Quarterly GDP (Mining sector)
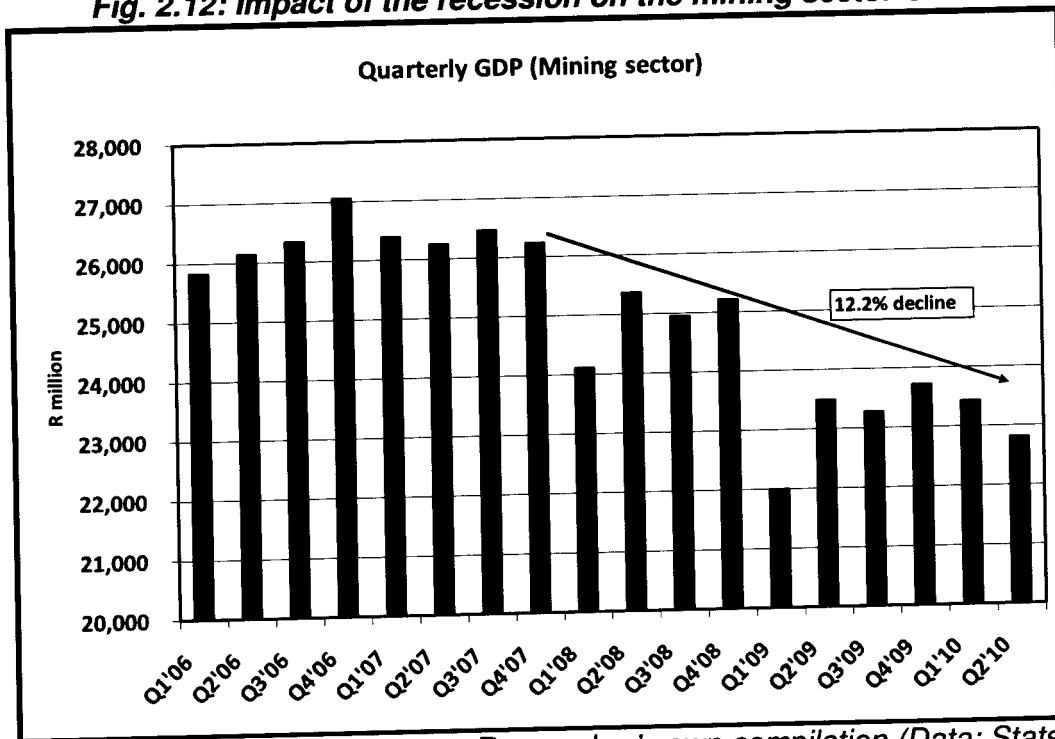
Source: Researcher's own compilation (Data: StatsSA)

2.4 Shareholder Value and Management Strategies

2.4.1 Theory

Shareholder value: Valuation, risk and return of investments

The term shareholder value is explained in chapter 1.1 and means that an investor buys shares in a public company and receives a certain proportion of ownership of that specific company. The shareholder is prepared to buy a share expecting a return on investment (either through dividend payouts or by share price growth). The total return of an investment (asset) is given by Equation 2.1 (Megginson *et al.*, 2007:181):

$$R_{t+1} = \frac{P_{t+1} - P_t + CF_{t+1}}{P_t}$$

R_{t+1} – Return at time t+1

P_t – Price of asset at time t

P_{t+s} – Price of asset at time t + 1

CF_{t+1} – Cash Flow generated in period from time t to time t+1

The only cashflow a shareholder receives during the period of investment is dividends (D). Rearranging Equation 2.1 then gives the return on an investment:

$$r = \frac{D_1 + P_1 - P_0}{P_0}$$

Rearranging the above equation to determine original purchase price of an investment or share, Equation 2.2:

$$P_0 = \frac{D_1 + P_1}{(1+r)}$$

The return (r) in this equation becomes the expected return that an investor will be satisfied with and is also called the discount rate. The discount rate should always be higher than the inflation rate in order to achieve a growth in real value of money for the investor.

With every investment there is some risk that the investment will not provide the return that the investor planned to achieve. A decrease in share price ($P_1 < P_0$, $r < 0$) or bankruptcy will cause a net loss to the investor's original investment (P_0).

According Megginson *et al* (2007:176) most financial models describe investors as risk averse. To persuade an investor to invest in a risky investment there must be the possibility of a very high return. This gives rise to a natural tendency of high risk investments providing the highest returns. An investor will therefore try and determine the following in order to decide whether to invest or not:

- What will the expected dividend payouts be?
- What will the expected growth in asset value (share price) be?
- What is the risk involved?

2.4.2 Dividend payouts

A dividend is a part of the profit of a company that is paid to the people who own shares in the company (Weber et al., 2006:157). A dividend policy refers to the choices made by a company's management about distributing cash to shareholders (Megginson et al., 2007:529). There are a few common dividend policies discussed by Megginson et al (2007:533-536). These include:

- Constant payout ratio policy: A company promises to pay a set fraction of its earnings to shareholders. This policy implies that dividends follow earnings and is usually unappealing to managers.
- Constant nominal payment policy: A company continues to pay the same nominal dividend each period. A step change in dividend payout will only occur when there are a significant sustainable increase in profits or otherwise when a real crisis (recession or other reasons for losses) occurs.
- Low-regular-and-extra policy: Companies pay out a low regular dividend with supplemental dividend payouts at irregular periods as earnings and future prospects vary.

It is clear that each of the above-mentioned policies' sustainability is dependent on profits. Investors usually react positively to an increase in dividend payouts and negatively to a decrease in payouts (Megginson *et al.,* 2007:541). Managers would therefore at all cost want to sustain profits in order to maintain dividend payouts or at least to minimise the reduction of dividend payouts in recessionary times.

Miller & Modigliani's research in the 1960's provided a conclusion that in a perfect capital market dividend payouts will not have any net effect on a firm's value. Markets are, however, not perfect and managers would tend to study the prevalent imperfections and perceptions in the markets to utilise dividend payouts in order to stimulate positive perceptions that would hopefully stimulate demand and increase share prices. Some imperfections that do exist and which influence dividend payouts are (Megginson *et al.*, 2007:552):

- Personal income taxes: When tax rates on dividends is lower than tax rates paid on capital gains, a clear pattern emerges of increased dividend payouts to ensure optimum shareholder value.

- Trading and other transaction costs: Paying out dividends and dealing in shares has some fixed transaction costs. If there is a big difference in transaction costs between the two activities it could provide a push effect to the cheaper side.

- Residual theory: Dividend payouts could be seen as a residual payout of cash available after companies have financed all there future investments (capital investments and other improvement and maintenance expenditure). This pattern is usually found in mature companies with a low growth potential. In such cases the dividend payout value could be re-invested by shareholders with a higher return than the company would have made by retaining such cash.

- Communicating information: Managers that promise high and constant levels of dividends portray a positive outlook for companies. This attracts investors, which could stimulate demand and increase share price.

It is clear that in practice, dividend payouts are an important factor for managers as well as investors. The tactful use of dividend payouts can (due to imperfect markets) improve overall shareholder value. In general the higher the dividend the better, and across all payout policies this can only be done by maximising profits.

2.4.3 Share price growth

The evolvement of the share price of a company can be explained at the hand of the normal supply and demand principle. The buyer of a share wants to buy it at

the lowest possible value whilst the seller wants to sell at the highest value. Share prices are driven by this principle, and markets will always strive to reach a point where the amount that a buyer is willing to pay is equal to the amount that a seller wants to get for his share. This is also called the market equilibrium (Carbaugh, 2007:40). The investor (buyer) will again ask the questions stated above to determine the attractiveness of the investment. Based on the investor's view of the future, a decision will be made to buy shares at a certain price or not. A buyer will see an opportunity (positive outcomes) whilst the seller sees a negative outcome of future investments and will therefore sell his shares in order to make other investments that is deemed more attractive. Once again the principle of expected return based on capital gains and dividend payouts should exceed a pre-determined growth rate (discount rate). According to Chelle (2010) some important factors influencing the value of a company's share price is:

- Dividend payouts and profits: Higher earnings attract investors as future returns are perceived to be higher. Higher earnings will also allow higher dividend payouts.
- Market sentiment or perceptions: Media reports and other public relation elements influence investors. A positive sentiment will make shares more attractive.
- Market environment: Market product demand, recessionary periods, war times and other markets influence possible investors' view of the future.
- Mergers and take-overs: The company that is being bought (take-over) usually has an increase in share price due to the perceived demand from the buying company. The buying company shares usually drop due to a diluting effect of shares and a drop in cashflow or increase in debt to fund the purchasing agreement.

Market perceptions
As already explained, the buyers of shares have a certain view of the future, which determines the type of share and the price that they are prepared to pay. This market view is influenced by general market perceptions. Negative publicity

sketches a negative outlook and a negative market perception is born (market perceptions are again based on risk). This influences the future outlook that investors have of the company. When Kumba Iron Ore announced that it would not supply iron ore at the usual "cost +3%" to the steelmaker ArcelorMittal, shares in the latter company dropped more than 20% in a single day. Although the dispute between the companies will not be resolved within the next year, the negative market perceptions about the company still caused a share price drop of which it has not yet recovered.

Similarly, Aquarius platinum's share price was negatively influenced more than once due to media reports that speculated long closures of mines due to safety risks. Although section 54 stoppages did occur, the outcome was not as serious as the media originally suggested. Share price values tend to take a long time to recover from such negative media reports. An environmental disaster like the BP Mexican Gulf oil spill during April 2010 was a publicity nightmare for the petroleum giant. BP's share price lost roughly 50% in the two months of the oil spill and only regained about 16% after the oil spillage was reported to be under control.

During recessionary times, markets are by nature very volatile and sceptic. Even the smallest negative publicity can cause major losses to shareholder value.

2.4.4 Risk

Recalling that investors are risk averse, it is clear that investors would seek the highest returns for a given risk. Similarly, if returns are equal, investors would choose the option with the lowest risk. Fig. 2.13 explains this phenomenon. The expected return of an investor is denoted by E_R and the risk of an investment is given as β (also called the measure of an investments systematic risk). An investments β is determined by the ratio of, the covariance of the specific investment's return with the returns on the overall portfolio (or market), and the portfolio or market variance (Megginson *et al.*, 2007:198).

Fig. 2.13: Using risk in making optimum investment decisions

Investment A	$E_R(A) = E_R(B)$ $ßA > ßB$	Investment B
X		✓
Investment A	$E_R(A) > E_R(B)$ $ßA = ßB$	Investment B
✓		X
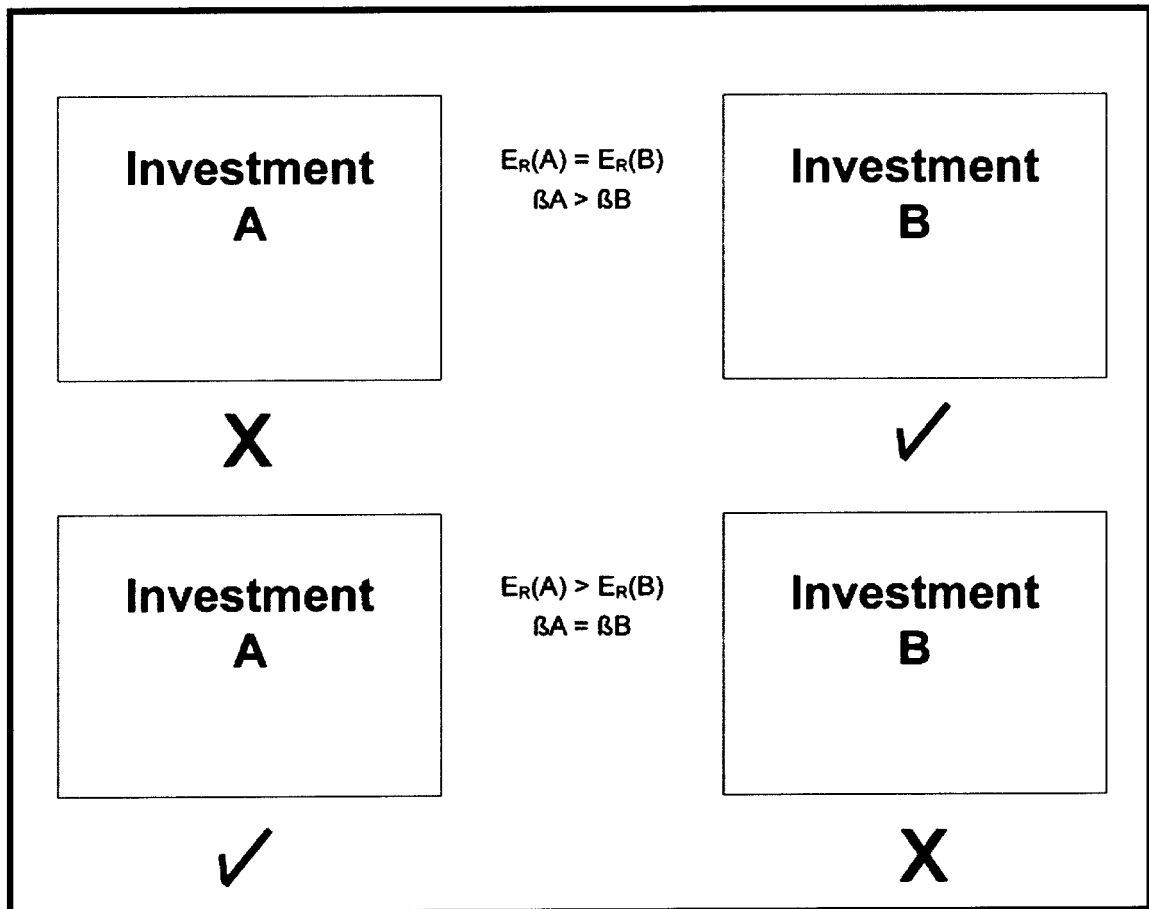
Source: Researcher's own compilation

Investment risk could be divided into two separate fields, namely external or environmental risk and company specific risks. External risks include, but are not limited to:

- Utility and infrastructure supply and reliability
- Market product demand
- Legislation
- Political stability and influences

Company specific risk is usually identified by risk to operations or risk to assets. These risks include unplanned stoppages, explosions, fires, equipment and property damage. In modern times other risks have achieved equal importance.

According to Neef (2003:42) other modern day company risks can be broken down into four broad categories:

Corporate Governance: Corporate Governance has been a huge talking point over the past 25 years with acts and codes of good practices being drawn up (Sarbanes-Oxley Act of the USA and King III) that specify in which manner the management teams and board of directors should manage their companies in a sustainable and ethical manner.

Environmental policies: The British Petroleum (BP) oil leak in the Mexican Gulf during April 2010 is a good example of environmental risk. Most countries have proper legislation in place that holds companies legally accountable for the impact of natural disasters and can add up to massive losses. Apart from cost implications, shareholder value is also lost due to the negative publicity.

Employment and human rights: Human rights, labour relations (labour unions) and other human resource related issues can evolve into company risk if not managed properly. Bad relationships with labour unions can lead to prolonged strikes, which not only have a negative impact on operations, but also serve as a form of negative publicity.

Product and workplace safety: Workplace safety is becoming increasingly important both out of a human resource risk as well as operational risk. Section 54 of the "South African Mine Health and Safety Act of 1996" provides the inspector the authority to stop all production at a mine of there is some evidence of a safety risk. This usually happens when there is a serious incident with loss of life. Most companies have suffered such stoppages in the past. Employees who are provided with an efficient and safe working environment will also be more productive due to their increased commitment and positive attitude towards the company.

Risk Assessment

Most authors explain the probability and consequence method to determine which risks have the highest potential for financial loss. The risks with a high probability

of occurring and of high consequence will have the highest risk rating and should receive the needed attention to mitigate or eliminate the risk (Fig. 2.14).

Fig. 2.14: Risk assessments using Probability and Consequences

	CONSEQUENCES	
PROBABILITY	**High**	**Low**
High	- Address the risk now! - Deflect & exploit if possible.	- Assess the risk. - Develop appropriate response in readiness.
Low	- Build awareness to avoid surprises. - Develop a strong contingency plan. - Turn risks into opportunities.	- Monitor & defend position. - Grow value.

Source: Researcher's own compilation (Adapted from Drew & Kendrick, 2005:31)

2.4.5 Shareholder value: A Management perspective

A public company is owned by its shareholders. A shareholder's ownership is related to the number of shares he possesses relevant to the total number of shares on offer (%). Each shareholder has a voting right equal to the percentage of shareholding. Shareholders vote at general meetings to appoint a board of directors which in turn appoint senior managers. The chief executive officer (CEO) is responsible for the day-to-day management of operations and carrying out policies made by the board. Both the CEO and board of directors serve at the will of the shareholders (Megginson *et al.*, 2007:17). Because the shareholders expect a certain return on investment (ROI), the top management structure of a

company has to manage the company's operations in such a way that the shareholders get their expected returns. The management team will then in turn be rewarded based on the returns that the shareholders obtain.

2.5 Optimising shareholder value in a recessionary period

Recessionary periods are usually characterised by low profits due to less spending of consumers as well as fewer loans from banks. According to statistical analysis of share prices done by Joubert *et al.* (2004:74), share prices are mostly driven by earnings in a period of growth. In a recessionary period, it was found that earnings (due to the fact that it is usually low) play a lesser role and that cashflow is the predominant determining factor. Companies with a higher cashflow will be better positioned to benefit from subsequent recovery periods. Investors would also rather invest in a company with good liquidity (low debt:equity ratio) in times when future growth is uncertain, because the company poses less risk than that of a company with more debt.

Due to the decline in platinum prices (more than 50% drop) profitability came under huge pressure and costs had to be reduced in order to ensure sustainability and minimise losses.

Profits (Current and Future)

Current profits: During the recessionary period platinum prices were on very low levels (more than 50% drop in value). Such a dramatic reduction in a companies' selling price causes huge pressure on profitability. In order to remain profitable, total costs of production need to be reduced and other forms of income maximised.

Future Profits: Whilst struggling to minimise losses due to a slow demand during a recessionary period, companies' management teams have to plan for the future as a recession is always followed by a period of growth and increase in demand. Remembering that investors base their share purchases on their view of future returns, management teams have to follow some strategies to obtain maximum value from post recession growth periods. Such strategies include:

New technologies: Mintek SA developed a new ConRoast process which utilises DC arc smelting technology capable of smelting high chrome baring platinum from UG2 ore. This gives it a considerable advantage over conventional smelters. The licence was originally awarded to Braemore Resources which is wholly owned by Jubilee platinum. In July 2010 Jubilee and Northam Platinum went into an agreement that such a facility will be constructed to treat PGM concentrates from Northam's new Booysendal project

Preserve cash flow: See section below.

Low debt: Having less debt means less interest payments and more scope for future expansion. Less debt also means lower risk to investors.

Investment: According to Pearce & Michael (2006:207) acquisitions and mergers (provided the funding is possible) can be made during recessionary times due to the fact that it would be much cheaper as the market value of shares is down. This could then ensure a higher return on investment in the recovery period after a recession. The trade-offs of spending money to acquire optimum returns in the recovery period versus preserving cash is a difficult conundrum for managers, and decisions on this should not be taken lightly.

Strategic alliances: Strategic alliances like the Northam-Jubilee agreement to implement new technologies as well as joint ventures in order to reduce capital expenditure is essential in optimising growth opportunities

Costs

At the end of 2008 Lakshmi Mittal (Owner and chairman of ArcelorMittal, the largest steel company in the world) announced that in reaction to the recession, his company needs to focus on the 3C's which is cash, cost and customer. Pienaar (2010) supports the focus on cost and believes profitability in the platinum sector will be sustainable if operations are in the lower half of the cost curve.

Some common cost reduction strategies are:

Retrenchments: According to Pearce and Michael (2006:204), fewer employees equal less cost of salaries and other employee related expenses. This also includes the reduction of contract workers.

Increase efficiency of operations: Focus on yield improvements. Mines could decide to only mine from higher quality ore bodies or improve smelting yield losses. Other improvements could be by using newer technologies or other creative improvements.

Admin & general expenditure: Reduce admin and other non-essential costs, which includes luxuries and travel expenses.

"Toll smelting": This happens when the company's own smelting capabilities is reduced by shutdowns or other operational problems. In order to meet customer demand and on time delivery (OTD) the ores are then smelted by a third party at much higher costs. In 2010 Lonmin's number 1 furnace was down for extended periods and a large amount of platinum was toll smelted. According to Mr. Ian Farmer (2010), CEO of Lonmin the total increase in costs for the estimated 20,000 oz, is roughly $17,5m. Such operational upsets should be avoided at all costs and proper risk management should be introduced to prevent similar huge upsets.

Cash

In an interview with the publication, Leadership SA, David Brown, CEO of Impala Platinum, stated that the key for survival during the recession period is to preserve cash (ANONc, 2008:86). Pearce and Michael (2006:204) explain how retrenchments and the reduction of assets can help to preserve cash. The reduction of assets is done by the selling of fixed assets or the reduction of working capital (reduced stock levels). The principle of don't produce what you can't sell applies.

The payout of dividends could have a positive impact on share price, but on the other hand it has a negative impact on cash flow. Some investors would like a company to rather keep profits in cash (this cash is then to be used to capitalize on the recovery period after the recession) than paying it out as dividends. Most companies cut their capital expenditure drastically in an effort to preserve cash. A cut in investments is an effective strategy to preserve cashflow, but on investment is also needed to maximise future growth and profits. Management teams will have to find an optimum balance.

Other forms of income and non-core businesses

In the platinum industry several non-PGM minerals are also beneficiated during the mining process. These metals include Nickel, Chrome, Copper and Gold. If the company has the mineral rights to beneficiate these metals it could generate tremendous benefits for the company as the cost of mining is already paid for.

Dividend payouts

Dividend payouts act as a stimulant to market perceptions. Better than anticipated dividend payouts is usually accompanied by share price increases. Managers should therefore carefully select a dividend strategy that will on the one side satisfy investors, but also on the other hand not diminish cashflow too drastically.

Risk management

The importance of risk management in preserving shareholder value has been explained in previous sections.

Flexibility and ability to adapt and change

According to ANONa (2009:14), some key characteristics of a successful strategy to minimise the impact of a recession is:

- Be willing and able to adapt to a different market environment. The market environment prior to a recession is that huge profits and productivity at all costs is most important. In recessionary times productivity takes second place to efficiencies and cost control.
- Challenge long-held beliefs and be bold enough to embrace ideas and strategies once deemed unthinkable.

BBBEE

The targets for employment equity and black ownership are a reality that each management team has to manage according to strategic objectives whilst protecting any negative impact on shareholder value.

Platinum price

A platinum companies' selling price is determined by the market basket price for platinum. Profits are therefore determined by cost of production as well as other incomes like by-product sales. The platinum basket price is determined by the normal supply and demand phenomena whereby a decrease in demand and subsequent over supply of product cause a drop in price. With the five companies under review also being the five biggest platinum companies in the world, a reduction in output of these companies has a direct impact on supply. In Fig. 2.1 it is clearly shown how the supply of platinum decreased as demand decreased. As the platinum companies reduced their production levels from the latter part of 2008, it boosted the recovery in platinum market price as supply continues to lag demand.

This monopoly that the big platinum companies enjoy should be managed carefully and the temptation to form a cartel (agreement with other companies to artificially reduce supply in order to boost market price) should be avoided.