

The effects of strikes in the South African gold mining industry on shareholder value

***Research submitted by
Aayesha Seedat***

Student number: 9801736N

A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Masters of Commerce in Accounting (50%)

Supervisors:

Tasneem Joosub and Professor Kurt Sartorius

March 2013

ABSTRACT

The recent spate of strikes in the mining sector in South Africa has created a perceived nervousness amongst shareholders. Within the mining sector in South Africa, gold mining is of significance historically and economically. This study aims to assess the impact of strikes on shareholder value in the gold mining industry during the period beginning January 2007 and December 2012, and uses the popular event study methodology developed by Ball and Brown (1968). The effect of the announcement and duration of the strike on the share price was tested. Significant negative cumulative abnormal returns were observed during the announcement of the strike. The impact of the announcement of protected strikes compared to unprotected strikes on the share price was compared. Although both types of strikes had a negative impact on shareholder value, an unprotected strike had less of an impact on shareholder value compared to a protected strike. This observation is of particular significance given the recent increase in unprotected strikes. Strikes with a duration of 15 days or longer resulted in smaller negative cumulative abnormal returns as opposed to strikes which lasted for less than 15 days.

DECLARATION

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Commerce in Accounting at the School of Accounting, University of Witwatersrand. It has not been submitted before for any degree or examination in any other university.

Aayesha Seedat

12 March 2013

ACKNOWLEDGEMENTS

I take this opportunity to express my sincere thanks and appreciation to the individuals who have provided me with guidance, support and input in the preparation of this research report.

I am extremely grateful to Tasneem Joosub and Dr Kurt Sartorius my supervisors, this dissertation would not have been completed without your support, guidance and encouragement. I would also like to express my appreciation to Mrs Dina Venter for her time, patience and support in the preparation of this research report.

I thank my family whose sacrifices, support and encouragement have been my strength and motivation. In particular I thank my parents Hoosen and Zaheda for their love and encouragement, my loving husband Saeed for his unfailing support, my children Luqmaan and Muhammad for sacrificing their precious time, and my mother-in-law Fatima and sister-in-law Shanaaz for their time and support. All your love will always be remembered.

TABLE OF CONTENTS

1.	INTRODUCTION	1
1.1	RESEARCH OBJECTIVES AND HYPOTHESES	2
1.2	CONTEXT AND SIGNIFICANCE OF THE STUDY.....	3
1.3	DEFINITION OF TERMS	4
1.4	ASSUMPTIONS	6
1.5	LIMITATIONS OF THE STUDY.....	7
1.6	DELIMITATIONS OF THE STUDY.....	8
2	LITERATURE REVIEW.....	9
2.1	INTRODUCTION AND BACKGROUND	9
2.2	STRIKE ACTION IN SOUTH AFRICA	11
2.3	STRIKE ACTION IN FOREIGN COUNTRIES	14
2.4	HOW IS SHAREHOLDER VALUE MEASURED?	15
2.5	THE RELATIONSHIP BETWEEN THE SHARE PRICE AND STRIKES	16
2.6	PREVIOUS RESEARCH	17
3	DATA AND METHOD.....	20
3.1	DATA AND POPULATION	20
3.2	SAMPLE	20
3.3	PROCEDURE FOR DATA COLLECTION AND MANAGEMENT	21
3.4	METHOD	21
	3.4.1 THE TEST PERIOD.....	23
	3.4.2 NORMAL RETURN	24
	3.4.3 ABNORMAL RETURN AND CUMULATIVE ABNORMAL RETURN	25
4	RESULTS AND ANALYSIS	26
4.1	PROTECTED STRIKES	28
	4.1.1 LONGITUDINAL CAAR – PROTECTED STRIKE COMMENCEMENTS	28
	4.1.2 LONGITUDINAL CAAR – PROTECTED SETTLEMENT DATE	30
4.2	UNPROTECTED STRIKES	32
	4.2.1 LONGITUDINAL CAAR – UNPROTECTED STRIKE COMMENCEMENT	32
	4.2.2 LONGITUDINAL CAAR – UNPROTECTED SETTLEMENT DATE	33
4.3	PROTECTED AND UNPROTECTED STRIKES - A COMBINED ANALYSIS.	34

4.4	COMPARISON BETWEEN PROTECTED AN UNPROTECTED STRIKES-EFFECT ON SHARE PRICE VALUE	36
4.5	STRIKE DURATION	38
5	ANALYSIS OF RESULTS	43
5.1	VOLUME TRADED	44
6	CONCLUSIONS AND RECOMMENDATIONS	45
7	AREAS FOR FURTHER RESEARCH	46
	REFERENCES.....	48
	APPENDIX A	53
	APPENDIX B	56

1. INTRODUCTION

The mining industry contributes significantly to the South African Gross Domestic Product (GDP) annually (8.5% of the 2011 GDP) and in recent days has been affected by serious strike action both legalised, and controlled by the registered unions as well as illegal wildcat strikes (Chamber of Mines South Africa, 2012; Reuters, 2012). Within the mining sector, the gold mining industry in South Africa not only holds historical value but has also contributed on average 21.1% per annum of the mining income to the GDP from 2002 to 2011 thus making it an important economic sector in South Africa (Chamber of Mines South Africa, 2012).

The South African unionised labour market is particularly active when it comes to wage negotiations which often results in strike action, however in recent days we have seen extraordinary increase in illegal strikes in addition to legal strikes (Gold Fields Limited, 2012). Strikes cause a disruption in production, but the net effect of the strike action on the value of the company is still uncertain. Protected (unionised) strikes in the mining sector are a common annual occurrence in South Africa, with an average of 1 030 workdays lost per annum for every 100 workers from 2007 to 2011, where the unions negotiate for higher wage rates in order to benefit union members (Department of Labour, 2011). Official statistics regarding the workdays lost due to illegal strikes have not been documented by the Department of Labour. However companies disclose these losses in their annual reports and press statements. One example is that of Gold Fields, which disclosed in a recent press statement that more than half of its workers (a total compliment of 40 000 workers) have been on strike; as a result, they estimate that approximately “35 000 troy ounces of gold production” was lost in the third quarter, ending 30 September 2012 (MacDonald, 2012). AngloGold reiterated the bleak situation when it stated that it has lost “30 000 to 32 000 ounces a week” (Cooke, 2012). From 2 October 2012 until 23 October 2012, Harmony Gold Mining Company Limited recorded a loss of 20 days of production, which translates into 13 000 ounces of gold; this led to management giving the employees an ultimatum to either return to work or be fired (Harmony Gold Mining

Company Limited, 2012a). The strike action observed in recent days threatens the profitability and production of marginal gold mines in South Africa. There is a possibility that some of these mines will require closure, which will, in turn result in job losses (MacDonald, 2012). This statement was confirmed by the Chief Executive Officer of AngloGold Ashanti, Mark Cutifani, when he said, "If the current unprotected strike continues, it compounds the potential likelihood of a premature downsizing of AngloGold Ashanti's South African operations" (AngloGold Ashanti Limited, 2012).

Summarising the purpose of this study, Neumann and Reder (1984) state that "the plain fact is that we do not know whether losses resulting from labour disputes are big or small or even if there are any". The recent strike at Lonmin plc's Marikana mine, in particular, appears to have signalled a potential turning point in employer-employee relations in the mining sector.

1.1 Research Objectives and hypotheses

The objective of this research is to evaluate the effect of labour strikes on shareholder wealth (which could indicate profitability of the company) in gold mining companies in South Africa, using all gold mining companies listed on the Johannesburg Stock Exchange (JSE) during the period January 2007 to December 2012. Specifically the following hypotheses are articulated:

Hypothesis One (H1_A): Protected strikes in the gold mining industry have a negative impact on share prices

(H1₀): There is no impact of protected strike activity in the gold mining industry on the share price.

Hypothesis Two (H2): Unprotected strikes in the gold mining industry have a negative impact on share prices.

(H2₀): there is no impact of the unprotected strike activity in the gold mining industry on the share price.

Hypothesis Three (H3): Settlement of strikes in the gold mining industry has a positive impact on the share price.

(H3₀): There is no effect of settlement of strike activity in the gold mining industry on the share price.

Hypothesis Four (H4): The duration period of gold mine strikes is negatively associated with its share price value

(H4₀): There is no association between the duration of gold mine strikes and share price value

1.2 Context and Significance of the study

The Labour Relations Act of 1995 allowed for collective bargaining as an important key determinant of an amicable labour relationship, by providing organisation rights to unions, and the continued provision for centralised bargaining councils. The 1995 Act promoted centralised bargaining reflected in the provision for statutory councils, and the provision that when arbitrating on the organisation rights of unions, commissioners should have a view to orderly collective bargaining in the industry or sector. However, even though the Labour Relations Act was introduced and implemented after 1995, South Africa lost 125 000 man days in the first half of 2000 through both legal and illegal strike action (Andrew Levy and Associates, 2012); if socio-economic stay away actions are included, then the figures can reach a million man days (Bendix, 2000).

The mineral resources of a country are tied to the wealth of the country and, in turn, its citizens and other stakeholders, such as shareholders/investors (PWC, 2011). One method of distribution of this wealth is through employment. Should the marginal mines be closed due to low production – as indicated by both AngloGold

and Gold Fields – many jobs will be lost (Cooke, 2012; MacDonald, 2012). Since many of the recent strikes are illegal, companies have had to resort to drastic action by firing those who refuse to return to work (Cooke, 2012). As a result, the unemployment rate will soar, adding to the already stretched South African social tax burden.

It is not only the tax burden that is a serious problem, but also the possible lack of foreign investment, which is an additional risk when profitability drops. This risk is highlighted by the fact that Standard and Poor's, a credit-rating agency dropped South Africa's sovereign rating "to reflect the deterioration in the social and economic environment" (Cooke, 2012:23). This drop in confidence in the country was coupled with a lowered rating by Moody's in September 2012, when they dropped their rating in South African Government bonds due to the unprotected strikes (Steyn , 2012). This rating drop will have a significant impact on foreign investors, such as the large American Pension Funds (Steyn , 2012).

When employees strike, there is a definite effect on the income of the employees and the shareholders, and in South Africa this industry is one of the key industries that bring in export income. By extending previous studies to the gold mining sector specifically, decision-makers – on the side of both the labourers and the shareholders – will make better informed decisions relating to the wage negotiations.

1.3 Definition of terms

The significant terms used in this study are defined as follows:

- Average Abnormal Return (AAR) – The average of the abnormal returns observed during the event window.
- Abnormal returns - The excess returns experienced over and above the normal return (De Jong, 2007). The Investor Dictionary (2012) defines abnormal returns as a term used by market traders to describe the difference

between a single share's performances in comparison to the average market performance over a set period of time.

- Alpha – The Investor Dictionary (2012) defines alpha as a risk-adjusted measure of the “excess return” on an investment. It further states that the difference between the fair and actually expected rates of return on a stock is called the stock's ‘alpha’. A ‘stock’ being a share in a company.
- Beta – Defined by the Investor Dictionary (2012), beta is a statistical measure of the relative volatility of a stock, fund, or other security in comparison to the market as a whole.
- Cumulative Abnormal Return (CAR) - Farlex (2013) describes the CAR of a share as the sum of all the differences between the expected returns and the actual returns up to a given point in time.
- Cumulative Average Abnormal Return (CAAR) – The average of the CAR during the event window.
- Estimation window – This is the period within the test period where the estimates for the event study are calculated.
- Event study methodology – This is a methodology that attempts to measure the valuation effects of a corporate event, such as a strike announcement, by inspecting the reaction of the share price around the announcement of the event (Fisher, 2011)
- Event window – This is a period within the test period where the abnormal returns around the event for the event study are calculated.
- Normal Returns – The average return over some defined period of time. (De Jong, 2007)
- Observational Period – This is the period, related to the strike announcement that incorporates the estimated event window periods that share price data will be obtained for each listed company (De Jong, 2007).
- Strike – Workers refusal to work because of a disagreement over pay or conditions (Oxford, 2011). In the context of this study, the protected strikes are those where employees have complied with section 64 of the Labour

Relations Act (LRA) unless different procedures are provided for in a collective agreement which is binding on employees organised by a mining union in South Africa and unprotected strikes are those other than protected strikes (Norton Rose Global, 2009).

- Thin trading – Thin trading is described by (Invest Word, 2013) as a day's trading where not many shares are offered for sale.
- Secondary data - InvestorWords (2013) defines secondary data as Data that has previously been collected (primary data) that is utilized by a person other than the one who collected the data.
- Securities Exchange News Service (SENS) – According to the JSE, “SENS is a system provided by the JSE, which disseminates corporation announcements and price sensitive information, i.e. mergers, takeovers, rights offers, capital issues, cautionary announcements, etc., all of which have an impact on the share price movement in the market.”

1.4 Assumptions

Several assumptions have been made in order to control the fact that several variables could affect the conclusions drawn from the data. These assumptions are considered valid and reasonable and are listed below:

- Share price volatility is a correct measure of the market's response and reflects all relevant information (Fama, Fisher, and Jenson, 1969; McWilliams and Siegel, 1997).
- The market processes information about the event in an efficient and unbiased manner. (Fisher, 2011)
- Gold mining shares are well traded and highly liquid.
- Decisions made by management are made with the intention of increasing shareholders' wealth. (Abowd, 1989)
- The data obtained from the Department of Labour is complete and accurate.

- The SENS announcements are complete in terms of the unprotected strike dates and information.
- The market processes information about the event in an efficient and unbiased manner. (Fisher, 2011)
- The event study methodology is based on the premise that new information like the announcement of a strike will initiate an immediate reaction from investors. (De Jong, 2007; McWilliams and Siegel, 1997; Seiler, 2000)

1.5 Limitations of the study

Due to the wide spectrum of variables that affect investor decision making there are significant limitations to this study. These limitations are listed below:

The event study methodology relies on the assumption of the efficient market (Fama, 1970). This assumption is not always valid.

The event study methodology studies the short run impacts of an event on shareholders only. The long run impact is not considered as a result is not investigated.

Share price may incorporate more information than just the market's response to the strike. Should another event affect the share price, this was investigated using media reports, SENS announcements and published quarterly or annual reports of the affected company. This was then taken into account when analysing the data.

Sample may not reflect the true situation with regards to the market's response as it is only reflective of listed mining companies.

Some companies in the population may not be on the Top 40 list of the JSE listed companies but rather on the AltX exchange which may mean that their market index funding may drop. This does will not necessarily impact the study as the data will be indexed before analysing.

Only the share price is assessed for each company without due deliberation on the impact on other social partners and the community at large.

1.6 Delimitations of the study

This study excludes:

- Companies not listed on the JSE. This is because of the expected availability and quality of the data desired.
- Analysing the strategic reason for the strike duration for each separate company. The intention of this study is to analyse factual findings and not to add normative value.
- All other analysis regarding company specifics (e.g. size) will not be carried out as this paper intends on focusing only on gold mining companies listed on the JSE.
- This study acknowledges that strikes are not the only reason for share price fluctuations, but based on the methodology one can assume that the fluctuation around the strike will relate mainly to the strike as the event being studied.
- The study does not take into account occurrences where successful negotiations have taken place between the union and employer as they do not result in a strike.
- This study does not analyse exact costs of the strike at company level which will include loss of employees, loss of suppliers, other labour costs like overtime or contract workers and a potential loss of customers.
- The profile of investors has not been investigated as this study focuses on the wealth effects of shareholders as a whole.

2 LITERATURE REVIEW

2.1 Introduction and Background

As cited by Becker and Olson (1986) Ashenfelter and Johnson (1969) identified work stoppages as the most important public issue relating to trade unionism as their impact is so great on the economy. Focussing locally, in the First Quarter 2013 review, the Chief Executive of Harmony Gold stated the following (Harmony Gold Mining Company Limited, 2012b):

“The past quarter has been a tumultuous time in the mining industry after unprotected strikes at one platinum mine spread across almost the entire mining industry, including our own Kusasaletu mine. In addition to the tragic loss of life at some operations in the mining industry and the economic cost of these actions, the scale of violence and intimidation has made media headlines around the world with concomitant impacts on investor sentiment, South Africa's sovereign credit rating, and national and industry reputations. These events have been extremely unfortunate, not only for the industry and its employees, but also for future growth and development in South Africa, given the critical role of gold mining in our country's economic development.”

Strike action in the gold mining industry in South Africa can be problematic and costly. However, the real loss to shareholders has not been investigated. This statement highlights the need to study the impact of the strikes on the gold mining industry in South Africa. In order to do this, an understanding of the circumstances that lead to the strike action needs to be obtained.

Management has a fiduciary duty to safeguard shareholder assets and, hence, manage costs appropriately (Companies Act No. 71 of 2008, s77). This principle is reiterated in literature where management goals should be shareholder wealth maximisation (Greer, Martin, and Reusser, 1980). Furthermore good corporate governance principles indicate that management should be transparent in their decision making and accountable to actions taken (Rossouw, van der Watt and

Rossouw, 2002) As such, management is always careful about giving in to labour demands, as this increases labour costs and, subsequently, production costs. As a result, management decisions at union negotiations and strike action affect shareholder value (Bhana, 1997; Nelson, Amoako-Adu, and Smith, 1994). When wage negotiations are entered into, management has one of two options: either to negotiate and meet the demands of the unions, or allow their employees to embark on a strike. This decision should be a calculated decision based on their fiduciary duty – that is, the option which will result in best safeguarding the shareholders' assets should be adopted (Bhana, 1997). However, as noted by Bazerman, Giuliano, and Appleman (1984), this does not always occur, thus resulting in greater losses for the shareholders. These losses have been mentioned by Greer et al. (1980) as the loss of profits in the short run, loss in the market due to possible loss of customers, damage to property, plant and equipment among others, shareholders drop in the evaluation of management, damaged labour relationships and overall damage to the company's reputation.

Several studies have looked at overall strike action in different countries and their effect on the share prices of the affected companies thus measuring the loss due to the strike. The results of many of these studies have shown that the market anticipates the strike and share prices drop before the strike action, and after the strike some shareholder value is lost overall (Nelson et al., 1994). However, the share price does drop further after the strike announcement, indicating that the market is not efficient in its knowledge and there is further shareholder value lost (Bhana, 1997; Nelson et al., 1994). Further studies were conducted to determine if the length of the strike affected shareholder value. Results showed that strikes that lasted longer than 10 days had a lower negative effect on shareholder value, as opposed to strikes that lasted less than 10 days, which had a more significant effect (Greer et al., 1980).

Firstly, most of these studies were conducted in first world countries where the political stability of the country is not questioned; hence, the economic environment

and investing habits of investors are not the same as those in South Africa (Greer et al., 1980; Nelson et al., 1994; Neumann and Reder, 1984).

Secondly, many of these studies have been performed in markets which are dominated by the manufacturing industry, which has a different labour supply to the gold mining industry (Bhana, 1997). Bhana (1997) confirms that the losses – even though they seem significant in the manufacturing industry overall – seem insignificant due to this industry's ability to draw on finished inventory on hand.

Thirdly, one study has been performed in South Africa; however, this study was performed prior to South Africa becoming a democracy and was also performed on the JSE as a whole (Bhana, 1997).

2.2 Strike Action in South Africa

Strike action in South Africa began in 1946 in the Witwatersrand when African mine workers on a gold mine went on strike for a more equitable wage (South African History Online towards a people's history, 2013). This marked the beginning of the fight by mine workers in South Africa. The main motivation was to fight the economic and moral imbalances resulting from apartheid. The primary group of workers belonging to unions at the time were the 'impoverished black worker', who needed the voice of collective bargaining to 'speak' on his behalf (Bhana, 1997). Today, these imbalances still exist, resulting in strike action still continuing.

Collective bargaining and strike activity – if legal – should not always be seen as a negative occurrence, as it is a sign of a healthy economy where negotiation and communication can take place. It can be used as a psychological outlet for employees to rid themselves of bitterness built over the period from the last wage negotiation, by being seen and having their voices heard (Bhana, 1997). In addition the fact that employees go on strike should highlight to shareholders that management may possibly not be acting with the correct corporate social

responsibility that is required by not paying a minimum 'living wage' (Industry Canada, 2012) However, the unprotected (illegal) strike action witnessed in recent days in South Africa has been coupled with violence and intimidation, which then adds to the negative impact on the affected companies and on the South African economy (Steyn , 2012).

Strikes are defined by Section 213 of the Labour Relations Act (LRA) as follows:

“The partial or complete concerted refusal to work, or the retardation or obstruction of work, by persons who are or have been employed by the same employer or by different employers, for the purpose of remedying a grievance or resolving a dispute in respect of any matter of mutual interest between employer and employee, and every reference to “work” in this definition includes overtime work, whether it is voluntary or compulsory” (“Labour Relations Act,” 1995).

According to Norton Rose Global (2009), there is a distinction between protected and unprotected strikes. “In order for a strike to be protected, the employees must comply with section 64 of the LRA unless different procedures are provided for in a collective agreement which is binding on employees.”

In recent days, there has been an unprecedented spark of unprotected strikes, which are strikes embarked on by employees when all the provisions of the Act are not met. Employees are protected under the law in terms of job retention during protected strikes. However during unprotected strikes employers have the legal right to dismiss through the court process where employees do not return to work.(Norton Rose Global, 2009)

During unprotected strikes legal procedures are not followed, thus employers are not able to adequately prepare for the strike action, resulting in a possible larger loss than what could occur under a protected strike, where procedure allows sufficient time for employers to put controls into place in order to minimise loss (Israelstam, 2013).

As stated in a recent article published by Times Live (2012), Bankserv Africa believes that “[t]he current spate of illegal and unprotected strikes may be a game-changer for South Africa's economy”. All previous studies in this field have looked at legal strikes only. Recent reports from affected companies state their losses due to the illegal strikes.

Gold Fields in their recent media release of the reviewed preliminary condensed consolidated results for the quarter and year ended 31 December 2012 annual report has stated the effects of the illegal strikes. Strikes at their KDC and Beatrix mines resulted in a loss of 110, 000 ounces of lost production, with a total drop in production of 7 percent. A total of 79 production days were lost by the company. The impact of these strikes as stated in this report by the Chief Executive Officer, Nick Holland, extends further than the production loss and related cash cost. It has impacted firstly on a company level the trust factor in employer-employee relationship resulting in management having to relook at the manner in which this relationship is managed, but secondly on a wider scale has impacted South Africa significantly. Not only has the country lost valuable and much needed tax revenue but more importantly has lost investor confidence. It is this confidence and thus cash injection that South Africa sorely needs to create jobs and achieve their longer term national development projects. He further reiterated that should government not revisit their management of the industry, it's attractiveness will drop in the eyes of the much needed investor.(Gold Fields Limited, 2013)

AngloGold Ashanti reported in their Report for the quarter and year ended 31 December 2012 a loss of \$208million. This loss resulted in them having to increase debt by one billion rands to maintain the business (AngloGold Ashanti Limited, 2013). The debt matures over tranches in the next two years thus highlighting the longer term cost of the illegal strikes.

Harmony Gold reported a loss of 9% of gold production in quarter 4 as a result of the illegal strike at their Kusasaletu mine. This drop in production has led to management reassessing the viability of the mine as a going concern. The deadline

to decide whether or not to reopen this mine is the 7th of March 2013 (Harmony Gold Mining Company Limited, 2013). The fact that management is willing to close the mine due to the strike has highlighted that the illegal strike has not only caused a severe cost to the business but also the possible loss of much needed jobs.

Other factors like the escalating cost of electricity with the increase in employee wage and other costs imposed on the industry by government has had a serious negative impact on the mining industry in South Africa as a whole (Gold Fields Limited, 2013).

The impact felt by these mining giants by the recent unprotected strikes highlights the importance of this study. In a recent article Norton Rose Global (2012) advise employers to not solely rely on union bargaining for wage negotiation. When times are tough employees have appeared to be willing to take up the threat of dismissal to have their views heard. The impact on business as a result has been detrimental as noted in the annual reports of each of South Africa's affected mining companies. This study has as a secondary analysis explored the difference in the impact of a protected compared to an unprotected strike on the share price.

2.3 Strike Action in foreign countries

Strike action is not unique to South Africa or to the mining sector. 2012 has seen strike action in USA with the biggest retailer experiencing strikes over low wages and inferior employment conditions, despite their efforts to derail unionisation in earlier years (Hines and Miles, 2012; Lee and Mas , 2009) In the education sector, teachers both in the USA and Britain went on strike in 2012 over wage and employment conditions (Harrison , 2012;Zhao, 2012). Also during 2012 BHP Billiton Mitsubishi Alliance in Queensland, Australia experienced striking action due to employees being unhappy over wage levels and other employment conditions (Honan , 2012). BHP Billiton has faced closure of mines in Queensland during 2012 due to escalating production costs and low commodity prices which then gets

severely aggravated by strikes (Ker , 2012). Most recently reports state that striking action in China is on the increase and has not been limited to a specific industry (Hurst, 2013). The impact of strikes on shareholder value has not been studied on a specific industry and in more detail the difference between protected and unprotected strikes has not been studied at all even though unprotected strikes are not a phenomenon to South Africa, like the recent threat of unprotected strikes in Queensland, Australia by nurses threatened with possible job losses (Helbig , 2012)

2.4 How is shareholder value measured?

In order to assess the actual shareholder value, one needs to understand the finance principles that determine share prices. Embedded in finance literature is the principle that capital markets are efficient and that the value of the company is a representation of the present value of the company, in terms of the expected future cash flows that will be derived from the currently-held assets of the company being the inherent value of the company (Becker and Olson, 1986; Hadassin, 1985). If the value of the assets of the company has not changed, yet the share price changes, this must be an indication that other elements are taken into account – other than the current assets held – when determining the shareholder value. This paper will be looking at one element: labour relations and related strike action.

Well known in finance literature is the theory developed by Miller and Modigliani (1961), where the authors assert that for a company's value to increase it must make investments that have a positive net present value and these investments will drive the future earnings of the company. Should the strike reduce the future earnings of the company then the share price should drop at the time of the strike, because financial markets are forward looking and that all expected disturbances in future cash flows should be immediately discounted back to their present value and reflected in an immediate adjustment of the current share price. Alfred Marshall's seminal work of 1890 in economics used a partial equilibrium model which may also

be applied to the labour market. When using the model, the individual represents the supplier of labour and employers the consumers, attempting to buy labour as demand for labour. Here equilibrium would be obtained at a price that matches the supply and demand for labour. Although this model may hold true in some markets, South Africa has unique circumstances that may upset this natural equilibrium. These circumstances include particularly strong trade unions, rigid rules about hiring and firing, and minimum wage requirements- all of which may tip the balance in favour of the individuals already employed (on the supply side) in spite of the high levels of unemployment in the country.

Management of the company should thus strive to effectively negotiate during the bargaining process in order to avert a costly strike, thus providing the best return possible to the shareholder.

2.5 The relationship between the share price and strikes

There are several ways that one could analyse the relationship between the share price and strikes. Firstly, one could look to the microeconomic principles of company value maximisation. In terms of microeconomics, companies will reach a natural equilibrium when the supply and demand of labour equates. According to the principle of partial equilibrium developed by Alfred Marshall, this point will be reached at the wage that the worker is willing to accept and the employer willing to pay (Byrns, 2011). At this point the marginal revenue per product is said to be maximised. However, when unions enter wage negotiations, the wage rate is increased and, hence, the equilibrium point is disturbed; that is all factors in the partial equilibrium have not been held constant. The company then has two options: (i) produce at a lower marginal revenue per product, or (ii) reduce labour (Case and Fair, 1996). Other factors like protective labour law also contribute to the disturbance of the desired labour market equilibrium.

Secondly, one could analyse the effect of the share price based on the basic impact on the business. The lack of labour, due to strike action, disrupts production, which

in turn lowers inventory levels. When inventory levels are low, sales are low (Nelson et al., 1994). In the case of the South African mining industry, this translates into lower export levels, which means lower overall GDP levels for the country. Clearly from the statement cited earlier by the CEO of Gold Fields, this impact has been felt by South Africa in 2012.

Thirdly, one could look at the relationship between the share price and strikes, and view strikes as an investment decision on the side of management. The future benefit for the company needs to result in an increase in the future cash flows to the company. These future cash flows is what an investor looks at when interested in the rate of return from their investment (Greer et al., 1980). When the strike decreases these future cash flows, it can be viewed as a negative future cash flow and, as such, management should attempt to prevent the strike from occurring. However, should the bargaining process and strike result in the company having to pay less in future in terms of labour costs, then this may be viewed as a positive investment, as the long run benefits would outweigh the short run cost of the strike (Bhana, 1997; Greer et al., 1980).

Therefore share price movements indicate market and, hence, investor sentiment. Research has shown that even in an inefficient market, announcements such as strike activity can result in share price movements (DiNardo and Hallock, 2000; Teoh, Welch, and Wazzan, 1999).

2.6 Previous Research

Bhana (1997) studied the effect of strikes from 1984 to 1993 on all companies which were listed on the JSE; he studied all strikes that took place during that period and the effect they had on share prices in the short term. His results show that in the short run, companies incur losses and don't recover the losses after the strike has terminated, hence shareholder value decreases. In this way, he was able to assess the overall value lost due to strikes, from 1984 to 1994. Bhana (1997) also explains

that if strikes are viewed as investments on the side of management of the affected companies, managers must then determine the cost of the investment being the strike. If this cost is a negative investment, then management must attempt to prevent strikes, in light of the fact that they have a fiduciary duty to ensure safeguarding of assets on behalf of the shareholders.

This study by Bhana (1997) was carried out during the apartheid era in South Africa; since then, no study has been performed, particularly in the mining sector, linking strikes to shareholder value.

Other studies around the effect of strikes on share prices have indicated that one of the shortcomings is that these studies are not industry-specific (Gramm, 1986). Many studies performed abroad relate to manufacturing industries rather than the mining industry (Bhana, 1997; Neumann and Reder, 1984). Another aspect of the studies in the manufacturing industry is that output is not greatly affected (Bhana, 1997). Yet, the studies that analyse the effects of strikes show that a negative effect occurs overall, which means that the underlying loss must relate to a different industry (i.e. not the manufacturing industry). It was noted by Becker and Olson (1986) that strikes cost the market substantially but these costs varied across industries that were included in their study.

Brown and Ashenfelter (1986) found that efficient contract models help determine expectations regarding the effect of strikes on the firm. Using these models, they claim that the union is aware that the firm has economic profits and wants to claim those profits for its members. Therefore, a successful strike would mean that the share of the profits has been transferred to the workers, resulting in a decrease in the shareholder value of the firm; in other words, the effect of the strike on the value of the firm will be proportional to the change in profits going to the firm. This was reiterated by Bhana (1997) when he cited: "Eaton (1972) showed that strikes tend to be good investments for unions and poor investments for corporations."

However, in their study, Nelson (1986) found that a strike action could have a positive impact on shareholders if the company has a high level of finished goods

inventory, thereby allowing inventory to reach an optimal level due to the strike action. A possible reason is that the manufacturing industry is more capital intensive than the mining industry, in relation to its dependence on production. Gold mines do not generally hold finished stock; for example, once the ore has been processed, it is formed into a gold bar, which is the finished product, and is almost immediately sold and dispatched to the refinery. In contrast, in the manufacturing industry, the producer may hold stock based on their demand levels and business model.

Greer et al. (1980) found that strikes which occur for a shorter period of time have a more negative impact on the share price of the company than strikes which continue for a longer period of time. Greer et al. (1980) also found that companies with longer strike action experienced an increase in the share price prior to the strike, before declining after the strike date. They concluded that the reason for the former movement in the share price was due to the fact that unions gain from short strikes and lose from long strikes, as most large, more profitable companies have the ability to withstand union demand and allow the strike to continue because they have the financial resources. It is these strong financial resources that the workers seek to take benefit from. The authors further explained that when management are willing to allow the strike to continue for a long period they must see longer term benefits to the company and are therefore willing to incur the short term cost of the strike. This means that unions maybe accepting lower long term wage without realising the impact on workers in the long run and the benefit to firms in the long term.

However in a study performed by Bhana (1997), he cited Chermesh (1982) observing that longer strikes seemed to result in a higher cost to the shareholder, unless management had other motivations to allow the strike to pursue, such as eliminating the unions' bargaining power. His results showed for the JSE listed companies that longer strikes directly affected the share price, resulting in a higher cost to the shareholder compared to shorter strikes. Furthermore a study performed by DiNardo and Hallock (2000) shows that longer strikes, violent strikes and strikes that impact the whole industry have a more negative impact on share prices, like those witnessed in recent days in the mining industry. The authors observed that

when strikes occurred on one company in an industry the loss to shareholder wealth was not as severe, in other words unions lost, as opposed to when strikes impacted a full industry, like the recent 2012 strikes.

3 DATA AND METHOD

3.1 Data and Population

This paper gathers empirical evidence of the effect of strikes by workers on the share price of the affected gold mining company which is listed on the JSE during the period between January 2007 and December 2012. The population entails all JSE listed gold mining corporations.

A list of protected strike dates, companies affected and the mining industry that it relates to was obtained from the Department of Labour (DOL), and was used to gather information on dates and duration of protected strikes that have affected gold mining companies listed on the JSE during the 6 year period. SENS announcements for the 6 year period for all gold mining companies were obtained from the McGregor BFA online database. Dates and affected companies for unprotected strikes were obtained from these announcements.

For both protected and unprotected strike dates the closing share price for each day in the test period was obtained from the McGregor BFA online database. This was captured on an excel spread sheet that was imported into the statistical package, SPSS to perform the statistical analysis.

3.2 Sample

A total of thirty strike events were included in the sample. Of the thirty strikes sixteen were protected and fourteen were unprotected. Strikes that occurred in more than one mine within a mining company with the same strike dates were recorded as a single strike. These were however recorded as separate strikes by the DOL as the mines are separate legal entities. This was a sufficient sample size for the event

study methodology to be effective and yield unbiased results that can be extrapolated and generalised to the larger population (Gramm. 1986).

3.3 Procedure for data collection and management

The data related to the protected strike announcements was obtained from DOL records, and data related to unprotected strikes was sourced from the SENS announcements, the Business Day and other financial publications. Data was sorted using an Excel spread sheet. The volume of shares traded of the affected shares was recorded as additional variables in the same spread sheet. The data was then imported into a statistics package (SPSS) where it was sorted to align the variables.

3.4 Method

This research aims to add to existing knowledge around the impact on shareholders' wealth of strikes in the South African gold mining industry. The methodology that is used is a quantitative methodology called the Event Study methodology.

The Event Study methodology was developed by Ball and Brown (1968) and Fama et al according to Bowman (1983), this methodology is used to study a range of events that affect company share prices and is often used in financial research. This methodology determines whether or not there is an abnormal share price effect associated with an unanticipated event (McWilliams and Siegel, 1997) Studies performed by Abowd (1989); Becker and Olson (1986); Bhana (1997) and Nelson et al. (1994) have used the Event Study methodology in similar studies with similar research objectives.

This method is based on the premise that markets operate efficiently and therefore investors immediately incorporate any new information that changes the distribution of expected future cash flows, into the current share price. This mechanism of efficient markets allows the full future impact of a current event to be observed in

changes in the current price. (McWilliams and Siegel, 1997; Reinganum, 1985). The speed at which the share price reacts to the event provides strong information as to how efficient the market is (Brown and Warner, 1985).

This study assumes relative economic efficiency in as much as it is expected that the full impact of the strikes will be reflected in the share price of these highly liquid shares, within 30 trading days. This is assumed as news of the strike activity often reaches the market prior to the actual announcement of the strike. The 30 day window period was extensively studied by Becker and Olson (1986) where the authors compared their study to the study performed by Neumann (1980). In their study they found that a longer window period of 30 days prior to announcement and 30 days post settlement of the strike was more appropriate to measure the cumulative abnormal return to the investor compared to the 14 days prior to announcement studied by Neumann (1980). The 30 day window period was then used and confirmed as appropriate by Bhana (1997). This is necessary as the bargaining process is often covered by the media as a result the announcement of the strike event is not new or random information to the market. The impact of the announcement on the share price should be calculated cumulatively from the appropriate time when the news reaches the market, assumed to be 30 days based on the prior research (Becker and Olson, 1986; Brown and Warner, 1985). This stance was confirmed by Brown and Warner (1985), where the authors reiterate the importance of using data prior to the event should the market have prior knowledge resulting in an anticipation of the event.

Pure economic efficiency would expect the price to be fully adjusted within a single day. Reaction in either efficiency context will result in fluctuation in the share price and shareholder value. The event in this study is the announcement by the affected gold mining company of their mineworker embarking on a protected strike. The idea of this statistical method is to find the abnormal return attributable to the strike event by adjusting for the return that arises from the price fluctuation of the market as a whole. Because markets are assumed to be forward looking and efficient and abnormal returns would fully incorporate the present value of any changes to future

cash flow expectations. Events like strike events may result in abnormal returns due to increased expectations of risk or lower expected future cash flows. The volume of shares traded around the event window was collected and analysed. In addition descriptive and inferential parametric statistics were run to analyse differences between protected and unprotected strikes.

3.4.1 *The test period*

The test period consists of two parts, the event window and the estimation window for both the announcement of the strike and the settlement of the strike. The event window, corresponding to the announcement of a strike, is the period from the announcement of the strike and a thirty day period following the settlement of the strike. Conversely, the estimation window is the 70 day period prior to the announcement of the strike, and the test period consists of both 30 days before and after the event (t_0) (Bhana, 1997) Refer to Appendix A for a visual representation of the test period.

Using the theory of the efficient market, the cumulative abnormal return over the event window should add up to zero. The reason for this is that on initial announcement of the strike if share prices drops they should conversely increase post settlement of the strike (Becker and Olson, 1986; Bhana, 1997). This reasoning was confirmed by Becker and Olson (1986) when the authors state that should the market be efficient, the negative abnormal returns on announcement should be offset by the positive abnormal returns on settlement of the strike. For this reason it is important to test the abnormal returns both during the announcement and settlement date resulting in the chosen test period.

3.4.2 Normal return

Within the Event Study Methodology there are three statistical methods of measuring normal return. The first of which is the Constant Mean Return Model, the second being the Market Model and the last a general type of factor model. The Market model is regarded as an improvement of the Constant Mean Return Model and has been used in previous studies to study the effect of strikes on share prices (Bhana, 1997; Nelson et al., 1994). The last model utilises a multivariate study which is not ideal when a study seeks to determine the impact of one event such as the strike (MacKinlay, 1997).

Abnormal returns as defined in the market model, are used in this cross-sectional event study to assess the impact of the events under study on the share prices of the identified companies.

In the market model, the normal return for company i on day t is calculated with the following formula:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

Where:

α and β are regression intercept and slope estimates, respectively, obtained from a least-squares regression model developed by fitting a straight line to the actual (observed) closing share prices in the estimation period. The ALSI index was used as the proxy.

A normal return is, thus, established for each company during the event window by extending the value of the above equation by the market portfolio return (R_{mt}) for each respective day of the strike. Because gold mining shares in South Africa are well traded and highly liquid, the ordinary least-squares (OLS) method for beta estimation is used.

3.4.3 Abnormal return and cumulative abnormal return

The difference between the actual return and the estimated return is referred to as the abnormal return. The predicted returns are calculated by using the α 's and β 's estimated when developing the model (equation (1)) with the estimation window's actual returns and the actual returns (R_{it}) of the event window for each company. The abnormal return calculation is formalised as follows:

$$AR_{i,j} = R_{i,j} - NR_{i,j} \quad (2)$$

Where:

$AR_{i,j}$ is the abnormal return of company i on day j ; $R_{i,j}$ is the actual return of company i on day j ; $NR_{i,j}$ is the normal return of company i on day j .

A total of 70 observations prior to the event available for each company were obtained and if we consider day zero to be the day on which the event announced under study was experienced in each company, then our observations will range from day-101 - to day 30, with day-101 to day 30 constituting the estimation period and day 0 to day 30 the event window.

The cross-sectional mean abnormal return was calculated as follows:

$$AAR_t = \frac{1}{N} \sum_{i=1}^N AR_{i,t}$$

The cumulative average residual method (CAR) uses as the abnormal performance measure the sum of each day's average abnormal performance. A column was created in a table which contains the cumulative average abnormal returns (CAAR) for every day in the event period.

In order to test whether the event had an effect on the share prices, the assumption is that the mean CAAR would be zero in the absence of an event effect. Thus, testing the null hypothesis:

H0: Mean (CAAR) = 0

Using a one-sample t-test will test whether the mean CAAR differ significantly from zero or not.

In an efficient market, the returns on a share price will be affected by any announcement which could impact the share price value. Therefore the Abnormal Returns (AR) and CAAR will be random except when an announcement of a strike is made. When the strike announcement reaches the market relative to day 0, then AR should not be 0. If the market is able to predict the possibility of a strike the difference between actual and predicted returns, should have a mean value of zero, because the change in future cash flows will have already been incorporated into the price.

All strikes which occur will result in a negative average abnormal return, this will result in an average deviation of the actual and predicted returns being negative due to the cost factor (Bhana, 1997).

4 RESULTS AND ANALYSIS

Two types of events were analysed, namely protected and unprotected strikes affecting JSE listed gold mining companies from January 2007 until December 2012.

The daily closing share price of thirty companies that experienced either one of these events was obtained from the McGregor BFA online data base. Sixteen companies experienced a protected strike and fourteen companies experienced an unprotected strike. These share prices were collected from at least 70 days prior to the event up to thirty days after the event.

Table 1 in Appendix A lists the strikes and the companies that experienced them, start date of the strike, duration (days) of the strike and whether it was a protected or unprotected strike.

To recap, there are 70 observations of share price values prior to the event window for each company and day zero is the day on which the strike event was experienced by each company. Thus observations will range from day -100 up to day 30, with day-100 to day -30 constituting the estimation period and day -30 to day 30 the event window

In the market model, the normal returns for company i on day t are calculated using the following formula:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

where α and β are regression intercept and slope estimates, respectively, obtained from an OLS regression model, and by specifying the daily return as the dependent variable and the ALSI as the independent market proxy index. Alpha and β model parameters were captured for each company and used to calculate the normal returns (returns that might have been expected had the strike not occurred). The abnormal returns (AR) for each company were then calculated by subtracting the normal returns from the actual returns for every day in the event period. This abnormal return was aggregated to produce a cumulative abnormal return (CAR) for each company.

One company was excluded from the analyses because the market index (ALSI) information was not available from the BFA McGregor prior to 2007, and the company experienced a strike in 2006. A further company was also excluded because specific data constraints were violated.

4.1 PROTECTED STRIKES

4.1.1 Longitudinal CAAR – Protected Strike Commencements

By comparing the mean of the window period (In this case the mean was the CAARs of protected, unprotected, or total firms) with the mean of the estimate period(mean of estimation period is by definition because of the abnormal returns), we can ascertain whether, and to what extent, the various category strikes have a significant impact on shareholder wealth.

Table 1 indicates intervals and days:

-30 days to +30 days= window for the event.

-1 day is the day before the strike starts.

0= day of strike activity.

1= 1 day after the strike

1-30= 30 days after the strike

Table 1 –T -Test of Protected Strikes commencement and strike settlement using day periodical analysis.

5 Intervals in	6 Strike Commencements (df=14)		7 Strike Settlement (df=14)	
	CAAR(%)	t-Test (df)	CAAR(%)	t-Test (df)
-30 to -1	-2.28	-0.927	0.62	.214
-10 to -1	-1.22	-.568	-1.15	-.561
-5 to -1	-1.96	-1.368	-3.14	-2.221*
-3	-1.30	-1.935	-0.23	-.031
-2	-0.50	-.612	-1.11	-1.316
-1	-0.25	-.358	-0.40	-.711
0	-0.69	-.964	-0.71	-.825
1	-0.05	-.119	0.34	.987
2	-0.92	-2.310*	-0.99	-1.667
3	-0.66	-.997	-0.15	-.216
1 to 5	-3.40	-2.419*	-2.55	-1.824
1 to 10	-7.52	-3.418**	-7.05	-3.478**
1 to 30	-9.43	-1.726	-7.11	-1.509

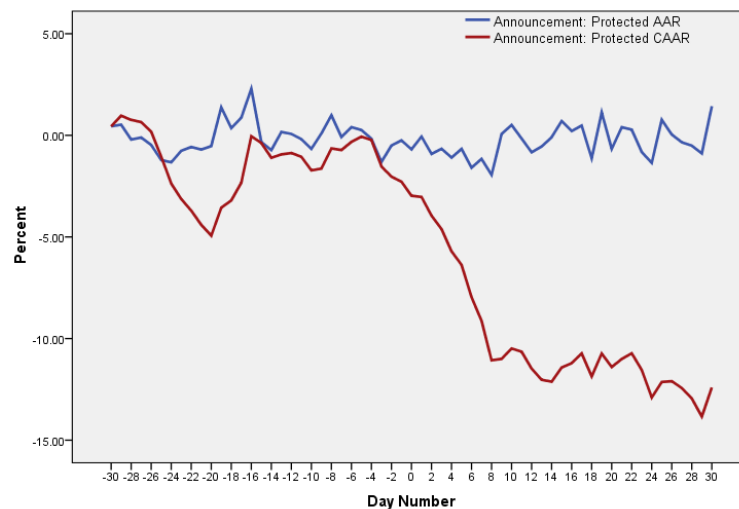
* Significant at the 0.05 level

** Significant at the 0.01 level

*** Significant at the 0.001 level

The fact that cumulative abnormal returns are most significant after 10 days suggests that markets do not immediately incorporate the new information into the share price but seem to take about two weeks to fully adjust. This is evident from Table 1. Figure 1 below shows a clear downward trend in share prices from day of strikes for protected strike activity. This result is consistent with hypothesis 1.

Figure 1 – Average abnormal returns and cumulative average abnormal returns of Protected strike activity.



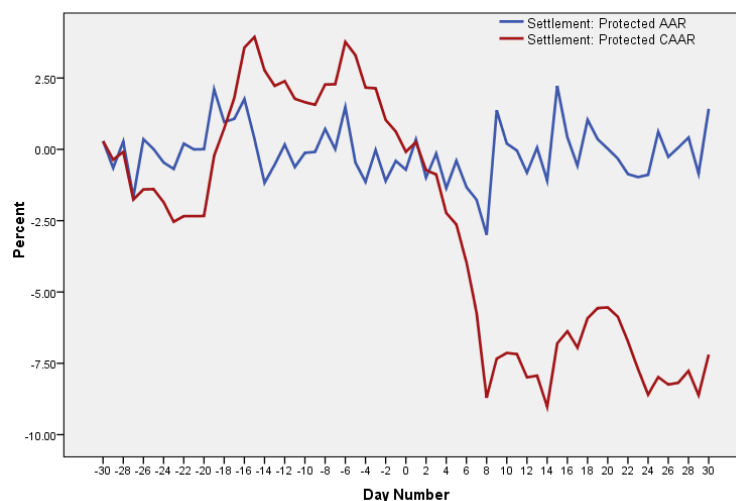
7.1.1 Longitudinal CAAR – Protected Settlement date

Table 1 indicates significant positive values of (-2.221) at a 5% level, and a p value of <0.05, which suggest that anticipation of strike settlement, share prices have a negative reaction few days before settlement. This result is inconsistent with hypothesis 3. This is difficult to interpret and may simply be a negative market reaction because of the increase in ‘sabre rattling” that occurs before strike settlement, from the heightening of the negotiation process. One to 10 days after settlement, t value = -3.478 and the p value < 0.001 this suggests that 1-10 days after settlement there is a negative reaction attributed to the investor realising that the settlement will add cost and depreciation to shareholder value. Table 1 displayed that there was a significant depreciation in shares from its estimate mean in the period of -5 days to -1 days. In the 5 days before the strike settlement period, there may be information leakage about an impending strike settlement. Again 1 to 10 days after strike, there is a significant fall in the share price. It would seem from the

results in Table 1 that investors expected the event, indicating that there was some information which had seeped into the markets via the internet or social media forums which could have contributed to this spill-over effect. Investors do not react as quickly to new information, or that the relevant information of the strike is not immediately revealed and may take some days into the strike for it to reveal its true implications for the investor. Information leakages would be detected in statistically significant negative returns in the thirty days leading up to the event.

Figure 2 shows the strike settlement activity on protected strikes appears to have a strong negative CAAR for several days after the settlement has been achieved probably due to the expected costs and decrease in shareholder value being gradually incorporated into prices.

Figure 2 – Strike settlement effects on share prices over the window period.



7.2 UNPROTECTED STRIKES

7.2.1 Longitudinal CAAR – Unprotected Strike commencement

Table 1 indicates intervals and days:

-30 days to +30 days= window for the event.

-1 day is the day before the strike starts.

0= day of strike activity.

1= 1 day after the strike

1-30= 30 days after the strike

Table 2 –T -Test of unprotected Strikes commencement and strike settlement using day periodical analysis.

7.3 Intervals in	7.4 Strike commencement (df=13)		7.5 Strike Settlement (df=12)	
	CAAR(%)	t-Test	CAAR(%)	t-Test
-30 to -1	-2.218	-1.038	0.249	-.125
-10 to -1	-0.291	-.264	-1.356	-1.373
-5 to -1	0.382	.281	-1.215	-1.439
-3	-0.19	-.365	-0.57	-.923
-2	0.31	.461	-0.03	-.049
-1	-0.11	-.162	-0.31	-.841
0	-0.11	-.251	0.23	.377
1	-0.70	-1.321	0.19	.265
2	-1.06	-1.960	-0.08	-.144
3	-0.10	-.147	-0.57	-2.066
1 to 5	-0.14	-.133	-0.87	-1.249
1 to 10	-0.07	-.076	0.39	.290
1 to 30	-2.23	-1.577	-3.02	-1.935

* Significant at the 0.05 level

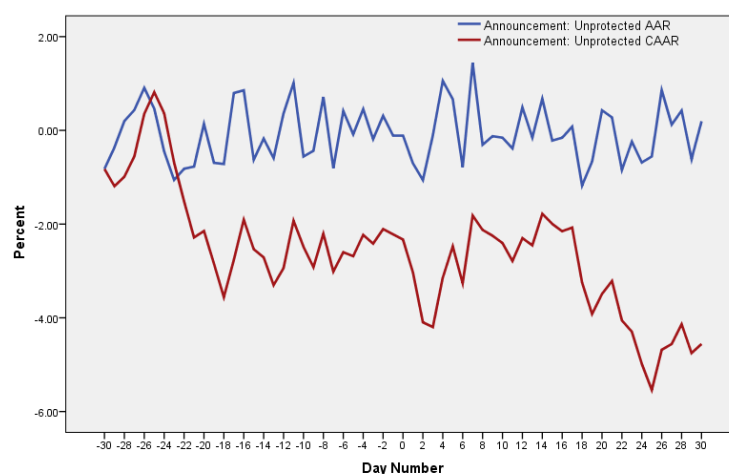
** Significant at the 0.01 level

*** Significant at the 0.001 level

Table 2 above provides a summary of the results for the different intervals during the unprotected strike action. The returns are statistically insignificantly different from zero.

Figure 3 below, shows a cumulative trend of average abnormal returns for unprotected strikes is downward sloping over the window period, so this is consistent with hypothesis 2.

Figure 3 - Average abnormal returns and cumulative average abnormal returns (unprotected)

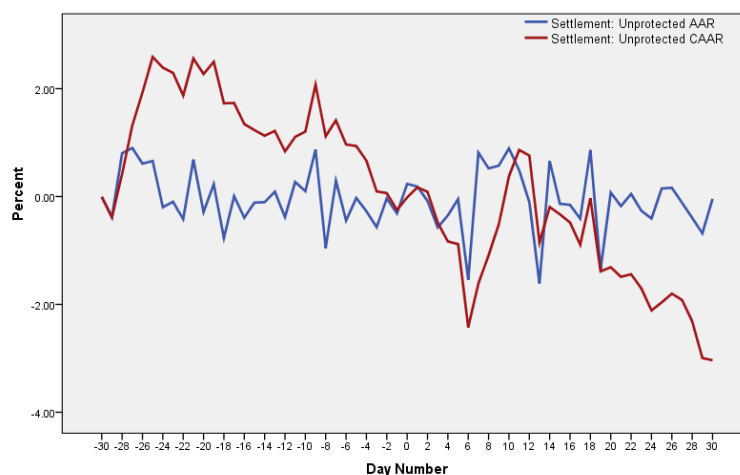


7.5.1 Longitudinal CAAR – Unprotected Settlement date

Table 2 shows no significant relationship between strike settlement in the mean for CAAR for each company compared with the estimation mean for the gap analysis period. Figure 4 below indicates that for unprotected strike settlements, which have

been achieved, there is a negative effect on the CAAR from 2 days of settlement to 30 days after the strike. This is consistent with hypothesis 3.

Figure 4 – strike settlement effects on share prices over the window period.



7.6 PROTECTED AND UNPROTECTED STRIKES - A COMBINED ANALYSIS

To test the effect of strike activity on share prices as a whole, an analysis of combined protected and unprotected strike activities in the mining industry was undertaken.

Table 3 indicates intervals and days:

-30 days to +30 days= window for the event.

-1 day is the day before the strike starts.

0= day of strike activity.

1= 1 day after the strike

1-30= 30 days after the strike

Table 3 –T -Test of Protected and unprotected strikes commencement and strike settlement using day periodical analysis.

7.6.1.1 Intervals	7.6.1.2 Strike	Announcement	7.6.1.3 Strike Settlement (df=27)	
	CAAR(%)	t-Test	CAAR(%)	t-Test
-30 to -1	-2.251	-1.399	0.220	.123
-10 to -1	-0.774	-.636	-1.243	-1.067
-5 to -1	-0.829	-.831	-2.246	-2.617*
-3	-0.76	-1.767	-0.28	-.563
-2	-0.11	-.203	-0.61	-1.105
-1	-0.18	-.378	-0.36	-1.052
0	-0.41	-.968	-0.27	-.502
1	-0.37	-1.018	0.27	.735
2	-0.99	-3.021**	-0.57	-1.370
3	-0.39	-.826	-0.34	-.905
1 to 5	-1.83	-1.960	-1.77	-2.163*
1 to 10	-3.92	-2.801**	-3.60	-2.527*
1 to 30	-5.95	-2.026*	-5.21	-1.995*

* Significant at the 0.05 level

** Significant at the 0.01 level

*** Significant at the 0.001 level

Strike commencement from 1 to 10 days after the strike for combined protected and unprotected strike there is a significant negative effect on CAAR and also from 1 to 30 days after the strike.

For the settlement, there are significant CAAR depreciation from 1 to 5 and 1-10 and 1-30 days after settlement, suggesting that the market anticipates the additional cost which would depreciate share value. Table 3 indicates from 5 days to one day before there is a significant depreciation in CAAR suggesting that heightening of tension in negotiation before settlement creates a negative reaction in share price values. This is consistent with hypothesis 3.

The combined analysis has shown a stronger relationship rather than the separate relationship of the strike activity in general on the share price value (CAAR).

7.7 COMPARISON BETWEEN PROTECTED AN UNPROTECTED STRIKES- EFFECT ON SHARE PRICE VALUE

An informal comparison between protected and unprotected strikes on share price values was undertaken. A comparison between protected and unprotected CAAR strikes over the post event window period (1-30) indicated a comparatively stronger fall in CAAR for protected strike activity compared with unprotected strike activity (Figure 6). This suggests that protected strike activity is better anticipated by the market, or that unions in unprotected strikes are in a worse negotiating position. This reaction is more pronounced than for unprotected strike activity.

Similarly for strike settlement as is evident from Figure 7, which indicates that protected strike settlement have a more pronounced immediate effect on CAAR than unprotected strike settlement. However there is a downward trend for both CAARs that is for both protected and unprotected strike activity.

Table 4 Difference between protected average CAAR and unprotected average CAAR for strike announcements and Settlements

	CAAR – Announcements		CAAR – Settlements	
	Protected	Unprotected	Protected	Unprotected
-30 to -1	-2.28	-2.22	0.63	-0.25
1 to 30	-9.43	-2.23	-7.11	-3.02

Figure 6– Comparison between protected strike commencement CAARs and unprotected strike commencement CAARS

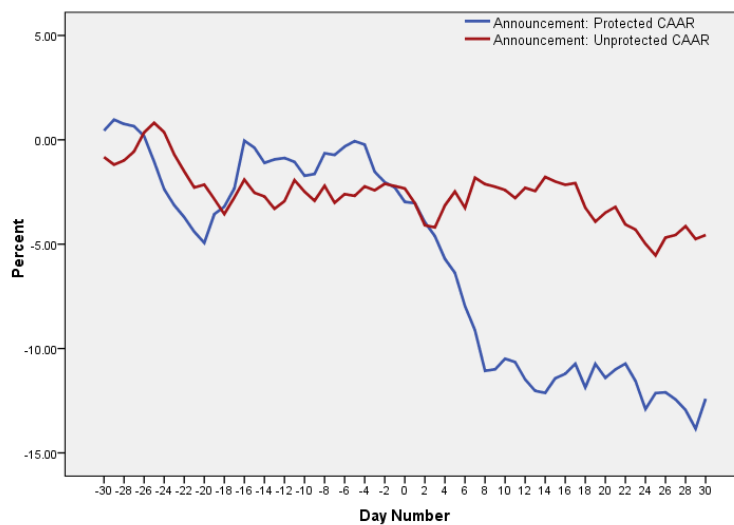
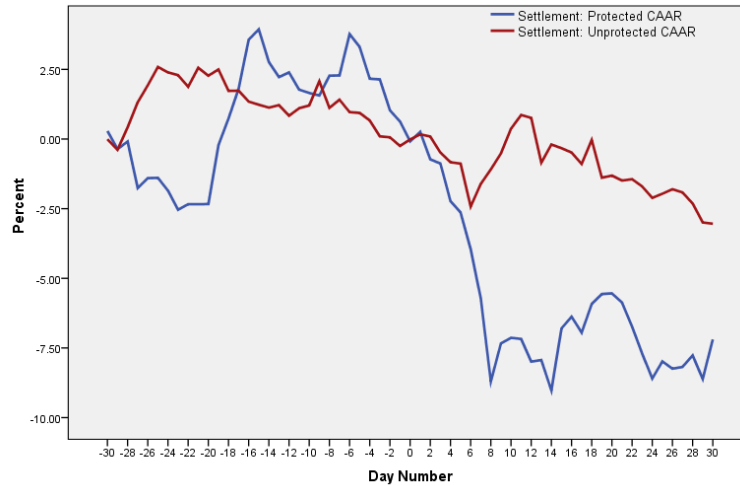


Figure 7– Comparison between protected and unprotected strike settlement CAARS



7.8 STRIKE DURATION

Another important effect of potential shareholder depreciation is the duration of strike action with longer duration strikes being associated with more protracted CAAR depreciation. An independent samples t-test using the strike duration (<15 days/>15 days) as factor and the CAAR of the companies as dependent variable was used to determine whether there is a significant difference between the duration of the strike activities

Table 5 and 6 indicates a significant association between length of strikes less than 15 days duration and share price depreciation ($t=-2.815.p<,0.05$)

Table 5– One sample t-test of duration of strike which is less than 15 days- Mean values - One-Sample Statistics^a

	N	Mean	Std. Deviation	Std. Error Mean
Announcement Event CAR	19	-.1145053	.17731081	.04067789

a. Duration (number of days) = < 15 days

Table 6 - One sample t-test of duration of strike which is less than 15 days- Confidence levels

One-Sample Test^a

	Test Value = 0					
	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Announcement Event CAR	-2.815	18	.011	-.11450526	-.1999663	-.0290442

a. Duration (number of days) = < 15 days

Table 7 and 8- shows that there is no association between length of strikes with a duration of more than 15 days and share price value.

The t test indicates a significant result for the shorter duration, whereas for strikes which occur for more than 15 days, there is no significant result. This result is inconsistent with hypothesis 4.

Table 7– One sample t-test of duration of strike which is more than 15 days- Mean values

One-Sample Statistics^a

	N	Mean	Std. Deviation	Std. Error Mean
Announcement Event CAR	10	-.0323200	.11415720	.03609968

a. Duration (number of days) = > 15 days

Table 8 - One sample t-test of duration of strike which is more than 15 days- Confidence levels

One-Sample Test^a

	Test Value = 0					
	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Announcement Event CAR	-.895	9	.394	-.03232000	-.1139831	.0493431

a. Duration (number of days) = > 15 days

Table 9 - One sample t-test for the comparison between the >15 and <15 day strikes- Mean values

Duration of strike activity	No of companies	Mean	Standard deviation	Std Error Mean
Less than 15 days	19	-.1055379	.18077882	.04147351
More than 15 days	10	-.0493730	.11480041	.03630308

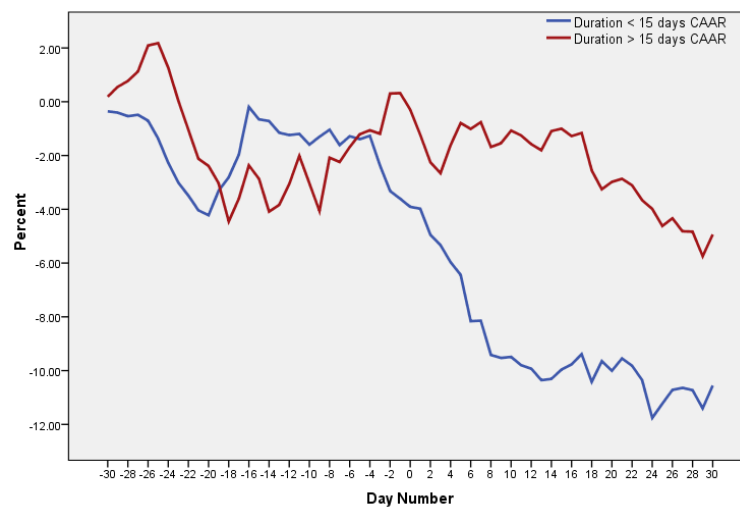
Table 10 - T-test for the comparison between the >15 and <15 day strikes

	Levene's Test for Equality of Variances		t-test for Equality of Means				
	F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Equal variances assumed	3.480	.073	-.888	27	.382	-.05616489	.06321353
Equal variances not assumed			-1.019	25.827	.318	-.05616489	.05511774

Table 9 and 10 indicate the mean difference of -.05616489 is not significantly different from zero.

This means that even though the mean CAAR for shorter strikes are more negative than the mean for longer strikes across the event window. Figure 8 below, statistically there is not enough evidence to find the difference to be significant. Not only is the longer duration strike not significantly more negative, but the effect of duration actually seems to have a negative absolute impact on CAAR.

Figure 8 – Comparing the cumulative average daily abnormal returns (CAAR) in the event window for strikes that lasted less than 15 days and those that lasted longer than 15 days



8 ANALYSIS OF RESULTS

Cumulative abnormal returns are shown in Tables 1, 2 and 3. These clearly illustrate that there is a negative abnormal return experienced as a result of the industrial strike action, that is both protected and unprotected strikes commencements and for the combined strikes. The abnormal returns and the cumulative abnormal returns are negative. This is statistically not significant on the day of the strike, but as the strike continues, especially with the protected strikes, there is a perception of the negotiations with the unions, which means an increase in the wages of the mineworkers and therefore an increase in the total cost to the investors. These results correlate with the results of several prior studies (Abowd, 1989; Becker and Olson, 1986; Bhana, 1997; Greer et al., 1980; Nelson et al., 1994). However, with the illegal or unprotected strike there is no statistical significance, this suggests that where employers are not obligated to increase the wages of the workers or even retain the workers, there appears to be no overall perceived increase in the costs of the strike (Norton Rose Global, 2009). Therefore with regards to the first and the second hypotheses there is an impact on the share prices of the companies for legal strikes, however there is no impact on share prices from the illegal strikes.

There are specific negative connotations with strike action as delineated in the research, the returns indicate that management needs to be wary of strike actions especially as it enters day 2 and continues until day 10 (Becker and Olson, 1986; Bhana, 1997). The announcements of the start of a strike, has to be managed as it will have a negative impact on the share price of a company which translates into negative shareholder value. This results from the large unexpected costs that have been described by Imberman (1979), which are not only the wage increase as a result of the strike but the other associated costs like loss of employer-employee relationship and other labour related costs.

Furthermore, in the study performed by Bhana (1997), the author noted that strikes with a longer duration had a larger negative impact on share prices unless management had alternative motivations other than wage negotiations. However this study revealed that longer strikes had less of an impact on share prices than those of a shorter duration. This observation relates to that of Greer *et al.*'s (1980), where the author also found that longer strikes had less of an impact on share prices than shorter strikes. The reason for this observation given by Greer *et al.* (1980) is that often the affected companies would be those of stronger financial wealth, resulting in the ability to function longer in striking conditions. Perhaps in the case of the mines it also allows the companies to engage in contract work thus allowing mining to continue during the strike.

The findings of this study are of substantial importance to South African mining companies providing empirical evidence for companies to avert strike actions. These results explain that the mining industry can expect the market to react negatively to strike actions, thereby resulting in an overall decrease in shareholder value. It is this expected shareholder value that will encourage the much needed investment in the South African economy which in turn translates into job creation (Harmony Gold Mining Company Limited, 2013).

8.1 Volume Traded

The graphs in the Appendix B, indicates that the commencement of strikes do not cause any significant reaction from the markets. There is a drop for some companies on the day of the commencement, but this is not a consistent trend for all the companies in the sample. Again the same occurs for the settlement of strikes, that is there is no significant trend or reaction to the settlement announcement of the strikes.

These results suggest that there is no major reaction from shareholders, resulting in a decrease in the volumes of shares traded of that firm immediately after the commencement of the strike event or the settlement of the strike.

9 CONCLUSIONS AND RECOMMENDATIONS

In line with prior research, share prices during protected strikes tend to decrease, thus decreasing overall shareholder value (Bhana, 1997; Brown and Ashenfelter, 1986; Imberman, 1979). This decrease or loss is often attributed to management and shareholders perceptions of the possible cost of the strikes. These costs include loss of production, increased labour cost, increased contractor cost, possible loss of suppliers and other hidden costs. Capital markets are supposed to be efficient, and therefore shareholders anticipate costs related to strikes. However the event window of the strike, that is, from the announcement date of the strike to 30 days after the strike, the share prices fell steadily over the event window, and the decline was significantly different from zero. Other aspects of industrial strikes have to be considered as well, that is mediation between trade unions and management, other economic information which could be perceived by shareholders regarding the future economic position of the company.

This study has revealed that both protected and unprotected strikes have an impact on the share price of the companies and thereby the shareholder value of a company. However the protected strikes have a more pronounced effect on the share prices than the unprotected strikes. This could possibly be due to reports being available to shareholders of possible strike action. Share trading by other stakeholders could also contribute to the negative market reaction to protected strike action. Because of the unpredictability of strike action and the duration thereof, it was expected that there would not be a positive reaction on day t-1, however the results showed a negative reaction which again suggests that strikes are not completely predictable. The results also suggested that markets react more severely to strikes that are for shorter periods than for longer periods. Strikes which are for less than 15

days are more significant. This is inconsistent with previous studies and the literature base, and with international trends. A possible reason for the opposite effect is that the shorter strikes are seen as more threatening and are also generally more violent here in South Africa. Also the shorter strikes which cause work stoppages have a tendency to recur.

These findings also suggest that the market does react negatively to an announcement of an impending strike, as well as a strike settlement. However there is evidence empirically that the overall negative reaction to commencement date is far more than the negative reaction to the strike settlement date, thereby resulting in a decrease in overall shareholder value for the company. This study extends previous research on strike announcements and strike duration, however it is limited to only a small sample of companies, but it does confirm findings by Bhana (1997), Brown and Ashenfelter (1986), Greer et al. (1980) and Imberman (1979) whereby markets still react negatively to strike announcements, whether it is protected or unprotected.

10 AREAS FOR FURTHER RESEARCH

This study has been completed taking into account all strikes (events) which were embarked before 31 October 2012; however, it would be noteworthy to mention that unprotected strikes at the time of the results have reoccurred in the mining sector as a whole and in the gold mining sector of South Africa during December 2012. This is the first time that unprotected strikes have been witnessed on this scale in the industry, with effects such as a drop in the credit rating of mining companies, in addition to a drop in South Africa's rating as a country (Gold Fields Limited, 2012). However, as this is a new event, its full effects have not yet been felt on the economy as a whole; as a result, the market sentiment is that of weariness.

This study has revealed areas where further studies can be explored in order to deepen the knowledge in this field. The areas identified are listed below:

- a comparison of protected and unprotected strikes in other industries in South Africa;
- the effects of the strike on actual production lost by the affected companies;
- the effect on other industries and in turn, a comparison with this study to determine whether or not the effects are similar
- the impact on media coverage of the strike on share price;
- the impact of strikes on corporate social responsibility within the firm; and
- the socio-economic effect, such as that of unemployment and the country's GDP.

REFERENCES

Abowd, J. M., (1989). The effect of wage bargains on the stock market value of the firm. *American Economic Review*, 79, 774-799.

Andrew Levy and Associates. (2012). *Strike Watch* [online]. Available from url <<http://www.andrewlevy.co.za/>> [4 November 2012]

AngloGold Ashanti Limited. (2012). AngloGold Ashanti Update on Unprotected Strike at SA mines: JSE Securities Exchange - SENS.

AngloGold Ashanti Limited. (2013). Report for the Quarter and Year Ended 31 December 2012. 1-44.

Ball, R, and Brown, P. (1968). An Empirical Evaluation of Accounting Income Numbers. *Journal of Accounting Research*, 6, 159-178.

Bazerman, M, Giuliano, T and Appleman, A. (1984). Escalation of commitment in individual and group decision-making. *Organizational Behavior and Human Performance*, 33, 141-152.

Becker, B,E, and Olson, C,A. (1986). The Impact of Strikes on Shareholder Equity. *Industrial and Labor Relations Review*, 39(3), 425-435.

Bendix, S. (2000). *The basics of labour relations*. Cape Town: Juta.

Bhana, N. (1997). The effect of industrial strikes on the value of shares listed on the Johannesburg Stock Exchange. *Investment Analysts Journal*, 44, 43-49.

Bowman, R,C. (1983). Understanding and conducting event studies. *Journal of Business Finance and Accounting*, 10(4), 561-584.

Brown, N, and Ashenfelter, O. (1986). Testing the Efficiency of Employment Contracts. *Journal of Political Economy*, 94, S40-S87.

Brown, S, and Warner, J. (1985). Using Daily Stock Returns: The case of Event Studies. *Journal of Financial Economics*, 14, 3-31.

Byrns, R. (2011). *Tools That Simplify Analysis, Alfred Marshall 1842-1924*, University of North Carolina. Retrieved 20/05/2013
http://www.unc.edu/depts/econ/byrns_web/EC434/HET/Pioneers/marshall.htm

Case, K,E, and Fair, R,C. (1996). *Principles of Microeconomics*. United States of America: Prentice-Hall, Inc.

Cooke, C. (2012). *AngloGold, Goldfields May Have Ratings cut to Junk by SandP*, Bloomberg, October 18, 2012 [online]. Available from url <www.bloomberg.com/news/2012-10-17/anglogold-gold-fields-may-have-ratings-cut-to-junk-s-p-says.html> [04 November 2012]

De Jong, F. (2007). *Event Studies Methodology*: Tilburg University.

DiNardo, J, and Hallock, K,F. (2000). When Unions "Mattered": Assessing the Impact of Strikes on Financial Markets:1925-1937. *National Bureau of Economic Research, Working Paper 7794*(July 2000), 1-29.

Fama, E, Fisher, L, and Jenson, M. (1969). The Adjustment Of Stock Prices To New Information. *International Economic Review*, 10, 1-21.

Fama, E,F. (1970). Efficient Capital Markets: A Review of Theory and Empirical Work. *Journal of Finance*, 25, 383-417.

Farlex, T. (2013). *The Free Dictionary* [online]. Available from url <<http://financial-dictionary.thefreedictionary.com/Cumulative+Abnormal+Return>> [20 January 2013]

Fisher, A. (2011). *Event Study Analysis, CLM Chapter 4* [online]. Available from url <http://www.vwl.unibe.ch/studies/3084_e/lecture7.pdf> [5 November 2012]

Gold Fields Limited. (2012). Q3 ended 30 September 2012 -unaudited results-. Johannesburg: JSE securities exchange - SENS.

Gold Fields Limited. (2013). Media Release, Quarter and Year Ended 31 December 2012 Reviewed Preliminary Condensed Consolidated Results (pp. 1-44).

Gramm, C. (1986). The Determinants of Strike Incidence and Severity: A Micro-Level Study. *Industrial and Labor Relations Review*, 39(3), 361-376.

Greer, C,R, Martin, S,A, and Reusser, T,A. (1980). The Effect of Strikes on Shareholder Returns. *Journal of Labor Research*, 1(2), 217-231.

Hadassin, I. (1985). An investigation into the behaviour of earnings and share prices of South African listed companies. *University of Witwatersrand*.

Harmony Gold Mining Company Limited. (2012a). Harmony issues final ultimatum to striking workers at its Kusasaletu mine: JSE Securities Exchange – SENS.

Harmony Gold Mining Company Limited. (2012b). Results for the first Quarter ended FY13 ended 30 September 2012 (07 November 2012 ed.): JSE Securities Exchange – SENS.

Harmony Gold Mining Company Limited. (2013). Results For The Second Quarter FY13 And Six Months Ended 31 December 2012. 1-36.

Harrison, A. (2012). *School strikes: NUT and NASUWT vote for more action over pensions* [online]. Available from url <<http://www.bbc.co.uk/news/education-17646215>> [25 February 2012]

Helbig, K. (2012). *Unions warn of unprotected strike action in response to 130 jobs being cut from health sector in Townsville region 03 September 2012* [online]. Available from url <<http://www.couriermail.com.au/news/unions-warn-of-unprotected-strike-action-in-response-to-130-jobs-being-cut-from-health-sector-in-townsville-region/story-e6freon6-1226464008301#sthash.oiHo9jhp.dpuf>> [28 February 2013]

Hines, A, and Miles, K. (2012). *Walmart Strike Hits 100 Cities, But Fails To Distract Black Friday Shoppers* [online]. Available from url http://www.huffingtonpost.com/2012/11/23/walmart-strike-black-friday_n_2177784.html> [25 February 2013]

Honan, K. (2012). *Strike to resume at BMA mines* [online]. Available from url <<http://www.abc.net.au/rural/news/content/201205/s3508186.htm>> [25 February 2013]

Hurst, D. (2013). *Worker strikes in China 'too common to suppress' 21 February 2013* [online]. Available from url <<http://www.smh.com.au/opinion/political-news/worker-strikes-in-china-too-common-to-suppress-20130221-2es8a.html#ixzz2Luk4eHCL>> [25 February 2013]

Imberman, W. (1979). Strikes cost more than you think. *Harvard Business Review*, 57(3), 133-138.

Industry Canada, (2012). *Corporate Social Responsibility - Employee Relations 30/04/2012* [online]. Available from url <<http://www.ic.gc.ca/eic/site/csr-rse.nsf/eng/rs00591.html>> [01 March 2013]

Invest Word. (2013) [online]. Available from url <http://www.investorwords.com/11288/thin_trading.html> [20 January 2013]

Investor Dictionary. (2012), available from url <<http://www.investordictionary.com>> [20 January 2013]

InvestorWords. (2013). *The Biggest, Best Investing Glossary On The Web* [online]. Available from url <http://www.investorwords.com/19207/secondary_data.html> [20 January 2013]

Israelstam, I. (2013). *Protesting could mean the end of your career* [online]. Available from url <<http://www.labourguide.co.za/general/protesting-could-mean-the-end-of-your-career-538>> [23 January 2013]

Ker, P. (2012). *BHP fights strikes as mine shut 12 April 2012*, Sydney Morning Herald [online]. available from url <<http://www.smh.com.au/business/bhp-fights-strikes-as-mine-shut-20120411-1ws6d.html>> [25 February 2013]

South Africa, The South African Department of Labour, (1995) *Labour Relations Act § 213*

Lee, D, and Mas, A. (2009). Long-run impacts of unions on firms: New evidence from financial markets, 1961-1999, Working paper 14709. *National Bureau of Economic Research*, 2009, 1-79.

MacDonald, A. (2012). *DJ Gold Fields Warns of Gold Industry Overhaul as Strikes Persist* [online], *Market Watch*, available from url <<http://www.marketwatch.com/story/dj-gold-fields-warns-of-gold-industry-overhaul-as-strikes-persist-2012-10-12>> [04 November 2012]

MacKinlay, A.C. (1997). Event Study in Economics and Finance. *Journal of Economic Literature*, 32(1), 13-39.

McWilliams, A, and Siegel, D. (1997). Event Studies in Management Research: Theoretical and Empirical Issues. *The Academy of Management Journal*, 40(3), 626-657.

Miller, M,W, and Modigliani, F. (1961). Dividend policy, growth, and the valuation of shares. *Journal of Business*, 34(4), 411-433.

Nelson, M. (1986). *The use of cost/benefit analysis in labor negotiations*: University of Bradford

Nelson, M Amoako-Adu, B and Smith, B. (1994). Impact of Labor Strikes on Equity Values: Canadian Evidence *Journal of Economics and Business*, 46, 153-165.

Neumann, G,R. (1980). The Predictability of Strikes: Evidence from the Stock Market. *Industrial and Labor Relations Review*, 33(4), 525-535.

Neumann, G,R, and Reder, M,W. (1984). Output and strike activity in US manufacturing: How large are the losses? *Industrial and Labor Relations Review*, 27(2), 197-211.

Norton Rose Global. (2009). *Unprotected Strikes: Remedies Available To Employers* [online]. Available from url <<http://www.nortonrose.com/knowledge/publications/43454/unprotected-strikes-remedies-available-to-employers>> [23 January 2013]

Norton Rose Global. (2012). *Unprotected strikes in the mining sector – Where to from here?* [online]. Available from url <<http://www.nortonrose.com/knowledge/publications/73541/unprotected-strikes-in-the-mining-sector-where-to-from-here>> [28 February 2013]

Oxford (2011). *Oxford Advanced Learner's Dictionary* [online]. Available from url <http://oald8.oxfordlearnersdictionaries.com/dictionary/strike_1> [13 January 2013]

PWC. (2011). *SA Mine, Review of Trends in the South African mining industry* [online], available from url <http://www.pwc.co.za/en_ZA/za/assets/pdf/sa-mining-2012.pdf> [20 May 2013]

Reinganum, M. (1985). The effects of executive succession on stockholder wealth. *Administrative Science Quarterly*, 31(1), 46-60.

Reuters. (2012). *Amplats strikes deal 29/10/2012* [online]. Available from url <<http://www.sundayworld.co.za/jobs/2012/10/29/amplates-strikes-deal>> [04 November 2012]

Rossouw, G,J, van der Watt, A, and Rossouw, M. (2001) Corporate Governance in South Africa, *Journal of Business Ethics*, May 2002, 37(3), 289-302

Seiler, M. (2000). The Efficacy of Event Study Methodologies: Measuring Ereit Abnormal Performance Under Conditions of Induced Variance. *Journal of Financial and Strategic Decisions*, 13(1), 101-112.

South African History Online towards a people's history, (2013). *1946 African Mine Workers Strike* [online]. Available from url <<http://www.sahistory.org.za/topic/1946-african-mine-workers-strike>> [25 February 2013]

Steyn, L. (2012). *Wildcat strikes tear into economy's growth* [online]. *Mail & Guardian*, available from url <<http://mg.co.za/article/2012-10-05-wildcat-strikes-tear-into-economys-growth>> [23 January 2013]

Teoh, S,H. Welch, I and Wazzan, C,P. (1999). The Effect of Socially Activist Investment Policies on the Financial Markets: Evidence from the South African Boycott. *Journal of Business*, 72(1), 35-89.

Times Live, (2012). *Illegal and violent strikes hurt South Africa: government* [online], available from url <<http://www.timeslive.co.za/local/2012/10/11/illegal-and-violent-strikes-hurt-south-africa-government>> [23 January 2013]

Zhao, E. (2012). *Chicago Teachers Strike Suspended, Students Head Back To School Wednesday* [online], available from url <http://www.huffingtonpost.com/2012/09/18/chicago-teachers-strike-s_n_1895082.html> [23 January 2013]

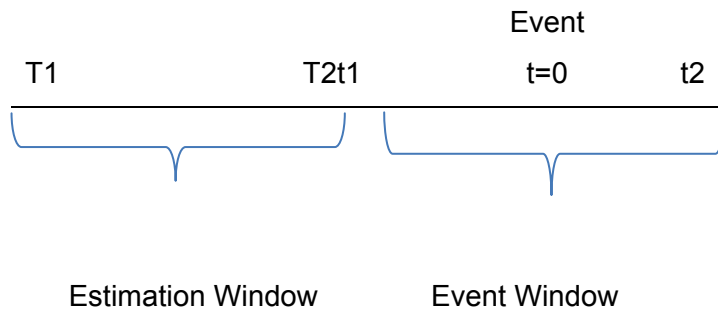
APPENDIX A

TABLE 1- Companies and lists of strikes

Strike No	Holding Company	Start t0	Duration of	Protected /
1	DRD Gold Ltd	13-FEB-2007	7.0	protected
2	Simmer and Jack Mines	09-MAY-2007	4.0	protected
3	Anglogold Ashanti	03-DEC-2007	2.0	protected
4	Goldfields Ltd	03-DEC-2007	2.0	protected
5	Anglogold Ashanti	22-JUL-2008	2.0	protected
6	Goldfields Ltd	15-JUL-2008	9.0	protected
7	Goldfields Ltd	06-AUG-2008	1.0	protected
8	DRD Gold Ltd	30-MAY-2008	3.0	protected
9	Goldfields Ltd	05-JUN-2008	2.0	protected
10	Goldfields Ltd	23-JUL-2008	1.0	protected
11	DRD Gold Ltd	15-SEP-2009	26.0	protected
12	Harmony Gold	14-JAN-2010	6.0	protected
13	GoldOne International	23-MAR-2010	30.0	protected
14	Anglogold Ashanti	28-JUL-2011	7.0	protected
15	Anglogold Ashanti	07-MAR-2012	1.0	protected
16	Village Main Reef	06-MAR-2012	2.0	protected
17	Anglogold Ashanti	20-SEP-2012	39.0	Unprotected
18	Anglogold Ashanti	25-SEP-2012	28.0	Unprotected
19	Harmony Gold	02-OCT-2012	24.0	Unprotected
20	Village Main Reef	27-SEP-2012	22.0	Unprotected

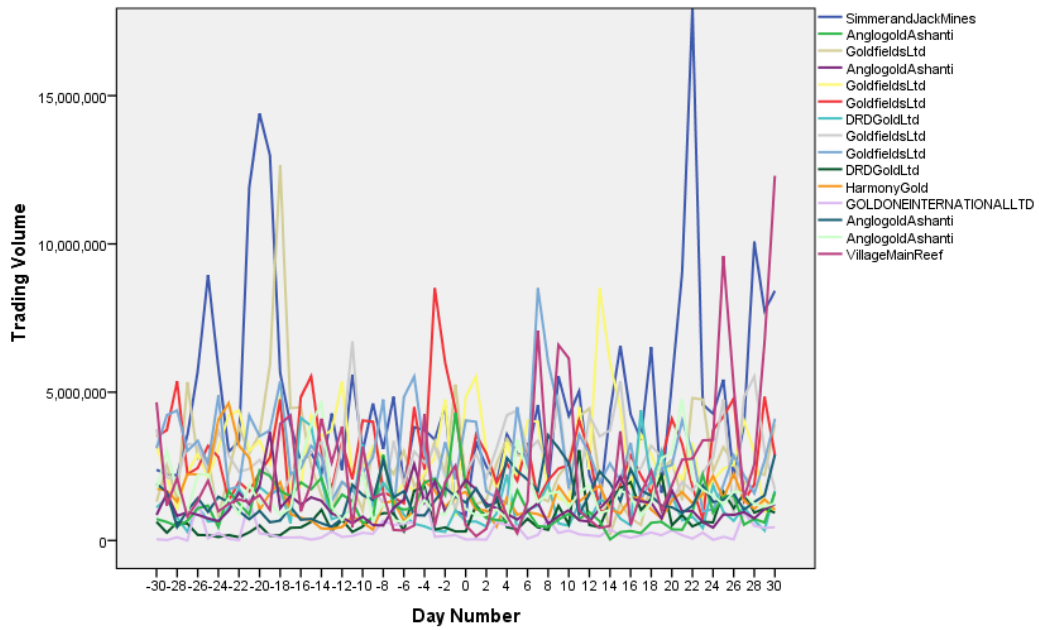
TABLE 1 continued - Companies and lists of strikes

Strike No	Holding Company	Start t0	Duration of	Protected /
21	Village Main Reef	06-NOV-2012	3.0	Unprotected
22	Village Main Reef	07-SEP-2011	35.0	Unprotected
23	Goldfields Ltd	29-AUG-2012	8.0	Unprotected
24	Goldfields Ltd	14-OCT-2012	24.0	Unprotected
25	Goldfields Ltd	09-SEP-2012	40.0	Unprotected
26	Goldfields Ltd	21-SEP-2012	26.0	Unprotected
27	Goldfields Ltd	14-OCT-2012	11.0	Unprotected
28	GoldOne International	01-OCT-2012	2.0	Unprotected
29	GoldOne International	03-JUN-2012	9.0	Unprotected
30	GoldOne International	09-MAR-2012	1.0	Unprotected
Total N	30	30	30	30

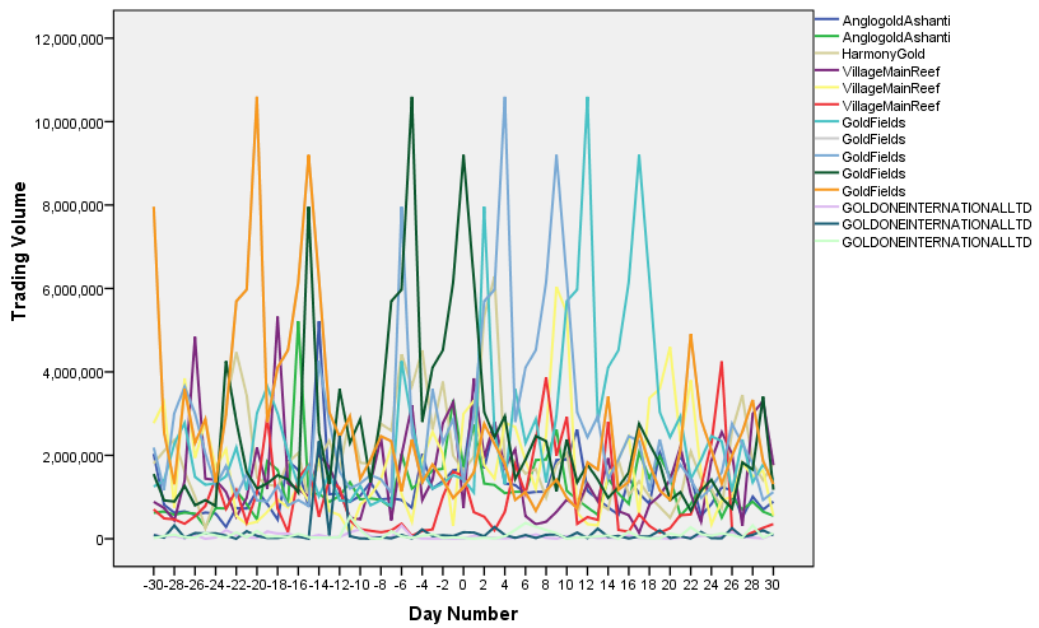
APPENDIX B

Actual Volume

Protected

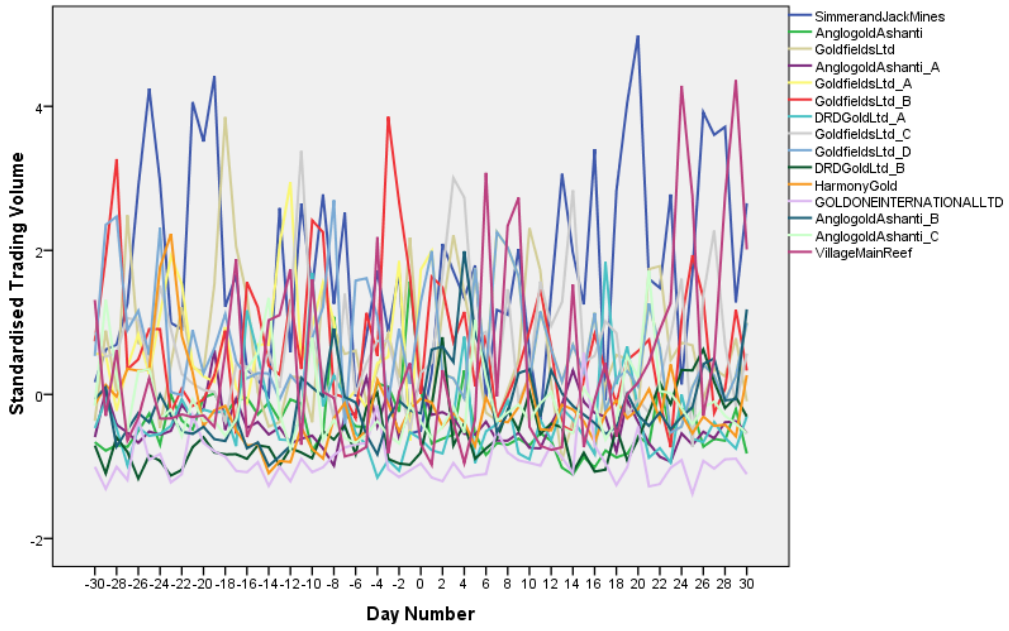


Unprotected



Standardised Volume

Protected



Unprotected

