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University of Pretoria

The impact of regulatory fines on shareholder returns

JJ Strydom

13397372

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Abstract

Recent media reports surrounding the 2010 Soccer World Cup infrastructure, and the fines imposed by the Competition Commission drew the public's attention to the impact that regulatory fines have on the returns earned by shareholders in these convicted companies. The purpose of the research was to establish if any significant impact on shareholder returns can be identified as a result of regulatory fines.

By using event study methodology, the researcher aimed to establish if an impact can be identified at the various stages of the regulatory process. Statistical tests were conducted via the implementation of Monte Carlo Simulations at the various stages of the process, to ensure that the findings were significant. The studies revealed that shareholder returns were neutrally affected at the initiation and payment stages of the process, but that the returns were positively affected at the conviction stage.

A style analysis (longitudinal study) was undertaken to determine if a portfolio consisting of stocks of convicted companies would out-perform the market over certain determined timeframes. As a baseline test, a portfolio was constructed of stocks of companies which have never been fined. The results revealed that both portfolios out-performed the market (ALL160) over a 24-year period, but that the portfolio consisting of convicted companies did not out-perform the portfolio of companies which have never been fined.

Keywords: Regulatory Fines, Shareholder Returns, Competition Commission, Event Study, Style Analysis

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 Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

JJ Strydom

10 November 2014

Dedication

I would like to dedicate this research project to my wife Amanda. Thank you for your continued love and support. It has been a challenging and testing journey, but we made it, and now the future awaits us.

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Finally, I would like to give all the thanks to God, for giving me the talent to study and for being with me every step of the way. His grace carried me through the tough times and allowed me to grow.

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Chapter 1 – Research Introduction

1.1 Introduction

The most striking development in modern antitrust law, is the global acceptance that cartels must be condemned as the market's most dangerous vice related to competitiveness (Kovacic, 2013). The Competition Commission of South Africa (the commission) defines competition as an important factor to society, as it enables the client or customer to receive overall value for money for a required product or service ("How to prevent, detect and report collusive tendering," 2014). It is this value for money received by the customer that is being threatened by collusion and cartel-like behaviour.

The current research is aimed at establishing if there is an impact on the shareholder returns of companies listed on the Johannesburg Stock Exchange (JSE), found guilty of collusive behaviour by regulatory bodies, and subsequently fined. The research further aims to determine whether the market will react in a different manner at various stages of the investigation process, particularly when the fine is imposed, and if this reaction is identifiable in the share price of the company.

The fines imposed by the commission on construction companies in 2013, as a result of collusive or cartel-like behaviour during the construction of the 2010 Soccer World Cup (SWC 2010) stadiums and infrastructure in South Africa (Berjamin, 2013), have brought the issue of collusion and the repercussions thereof to the public's attention. Following the announcement of the imposed fines as a result of the SWC 2010 collusion, the Competition Tribunal of South Africa (the tribunal) has commented on the possibility of a second layer of investigations into previously undisclosed collusion. These investigations are to be conducted on various JSE-listed construction companies, as a result of their suspected collusive involvement in railway upgrades put to the market for tendering by Transnet.

Remaining in the built environment, in 2012 it was reported that the four main cement producers in South Africa were found guilty by the commission of the formation of a cartel pertaining to price-fixing and market division. The cartel members included Pretoria Portland Cement Company Limited (PPC), Lafarge, Afrisam SA and Natal Portland Cement Cimpor (NPC-Cimpor). The conviction was as a result of an investigation initiated in 2008. The fines imposed ranged between 3% and 6% of the

annual turnover in 2010, with values ranging between R124 million and R148 million ("Lafarge fined in cement cartel case," 2012).

Collusive tendering sometimes referred to as "bid-rigging" or cartel-like activity, is not just restricted to the construction industry, but affects a wide variety of industries. An investigation of Unilever South Africa and Sime Darby Hudson and Knight was announced by the commission in 2014, with specific focus on allegations of price fixing on edible oils and margarine (Motsoeneng, 2014). The fuel industry has also been the subject of earlier investigations by the commission. Sasol, in 2009, was fined in excess of R250 million after admitting to collusion in two fertiliser cases (Mabandu, 2009).

From an international perspective, Walmart was found guilty of paying in excess of $24 million in bribes to Mexican officials to facilitate the rapid expansion of its operations in that country (Currell and Davis Bradley, 2012). In 2009, Microsoft was fined approximately $1.2 billion by the European Union's Competition Commission for its failure to provide clients with a choice of web browser.

During 2012, five pharmaceutical companies were subject to fines amounting to approximately $5.5 billion for the settlement of allegations related to fraudulent activities including, illegal marketing and promotion and the withholding of health risk information (Isaacs, 2013). GlaxoSmithKline (GSK), one of the companies convicted, was then fined 11% of the revenue associated with certain antidepressants, due to fraudulent activities linked with the marketing of these products, and other wrongdoings. The value associated with the fine was approximately $3 billion (Isaacs, 2013).

The convictions of these companies are testimony that collusion can infest any industry and be visible in any country. Unfortunately the fine pay out, in general, does not appear to be much of a deterrent for fraudulent or collusive activities (Isaacs, 2013).

The Competition Commission of South Africa defines collusive tendering as the evidence of the lack of competition amongst companies, generally viewed as competitors during bid submission for specific projects or contracts ("How to prevent, detect and report collusive tendering," 2014). Collusion creates a non-competitive bidding environment and increases standard market costs, as well as causing economic damage to the bidders not involved in the cartel activity (Chotibhongs and Arditi, 2012). The commission also states that collusive behaviour can take the form of complementary bidding, bid suppression and bid rotation. These practises lead to increased prices, lower product quality, the stifling of innovation, decreased product

development and harmful consequences to consumer welfare as a result ("How to prevent, detect and report collusive tendering," 2014).

The consequences of collusion listed by the commission, however, exclude the impact of this behaviour on the shareholders of an organisation. The fine imposed by the regulatory body affects the organisation from a financial as well as reputational perspective. For the purposes of the current research, the reputational damage will be discounted, and the main focus will be on the impact on shareholder returns, specifically the share price and dividends paid.

1.2 Research Problem Definition

Various commentators suggested that the companies found guilty of collusion during the construction of the SWC 2010 stadiums, must be prevented from doing any further government work. Other parties advocated the implementation of further regulatory measures, criminal sanction against the convicted companies, or even increasing the already imposed fines (Planting, 2013). Despite various suggestions, further reports stated that although the commission imposed these fines, some listed construction stocks made strong gains during the latter part of 2013 (Hedley, 2014).

The question now arises as to whether the market prices in the risk of the anticipated fine at the announcement date of the investigation, will cause the stocks not to reflect abnormal or unexpected returns at the time the fine is imposed. Another view point can be argued that the gains by shareholders as a result of collusive behaviour exceed any potential future loss, and therefore the share price will remain stable in relation to market conditions during the aftermath of a regulatory fine.

It is important to note that all actions by regulators, good or bad, are aimed at the consumer and the insurance of overall consumer protection, as well as the receipt of services and products which are appropriate to the customer as well as well understood and needed by these customers (Blanc, 2014). It can therefore be posed that regulatory fines should aim at protecting the consumer by being substantial enough in value, to deter collusion amongst convicted companies as well as potential collusive behaviour at industry level.

The size of the fine can therefore be viewed as a potential problem area in collusion detergence, due to the fact that it appears not to affect the convicted party in such a way that the penalty is reflected in the share price. Hedley (2014) reported that share

prices of convicted companies reflected strong gains subsequent to fines being imposed. Similarly, Isaacs (2013) reported the relative ineffectiveness of regulatory fines to serve as a deterrent for fraudulent activity in the pharmaceutical industry. These reports contribute to the general and increasing perception that regulatory fines fail to serve their purposes in the market as a method of consumer protection through enforcement.

The apparent lack of market reaction to regulatory fines, currently advocated by the media, creates the opportunity for further investigation and research to determine if the impact of regulatory fines on shareholder returns can be identified and quantified. Certain objectives have been identified by the researcher to assist with the determination of the identified research problem.

1.3 Research Objectives

The current research will afford the opportunity to establish if regulation and regulatory fines have an identifiable impact on shareholder return, and if the magnitude of the fine will be sufficient to prevent similar behaviour in future. The main objectives of the current research centralised around the impact of the fines on the stock price, providing descriptive statistical data and analysing the long-term effect of collusive behaviour. The main objectives of the current research are stated below.

1.3.1 Objective 1 - The impact on the stock price of the convicted company

The main objectives to determine the impact of regulatory fines can be viewed as the following:

- Is there a market reaction when an announcement is made that a specific company is the target of a regulatory investigation and suspected of potential collusive behaviour? This will be referred to as “The initiation date”.

- Is there a market reaction to the announcement that the investigated company has been found guilty of the regulatory transgression and will be liable to pay a fine? This will be referred to as “The conviction date”.

- The reaction of the market on the date the fine is paid by the convicted company. This will be referred to as “The payment date”.

The possibilities exist that in some instances the dates mentioned above might be relatively close and therefore create confounding events during the event window, making it difficult to distinguish the market reaction to any particular event, and rather view these dates as a single catalyst. In instances where these dates are subject to greater intervals, the market reaction will be identifiable through the performance of the share price at the various stages of the regulatory process.

The impact on the return to the shareholders will be assessed through the variation in the share price, taking into account the normal overall market performance as well as the company's performance in the market. The dividends paid during the year the fine is imposed will be included in the total return to the shareholders.

Through investigation, and by providing data to address the objectives stated, the researcher will be able to establish at what stage of the process the greatest impact is noted and recorded. The time it takes for the share price to recover after the initial impact of the catalyst, if an impact is indeed identified and recorded, will also be investigated. Further objectives can focus on investigating the segmentation of the identified companies into specific industries, and whether shareholders react differently to regulatory fines in different industries.

1.3.2 Objective 2 – Descriptive statistical data

The descriptive statistical data will allow for the determination of the following:

- The total fine value per company.
- The value of fines per industry.
- The time between the announcement of the investigation and the conviction of the company.
- The quantum of the fine per conviction.

These findings will allow the researcher to establish if certain sectors are more prone to collusive behaviour, or if regulation is more focussed on certain sectors, which can be the cause of greater convictions. The findings can also establish if certain companies are repeat offenders and if regulatory fines serve as a deterring agent or not. Finally, the timing between the announcement and conviction and the quantum of

the fine, may allow for the market to prepare itself for the possibility that a firm can be imposed with the liability, but the quantum can project how much risk the market will build into its forecast, which might influence the overall impact.

1.3.3 Objective 3 – Analysing the long-term effect of collusive behaviour

The final objective of the research will take the form of analysing an investment portfolio as part of a historical longitudinal study. The portfolio will initially identify two groups (portfolios) of companies and compare the performance over a determined period of time.

The one group will consist of a portfolio of companies that has never been subject to a regulatory investigation and therefore never fined. The other portfolio will include companies which were subject to an investigation and later fined.

The objective of this investment portfolio comparison is to determine whether the portfolio that was subject to regulatory fines performed in a manner distinctly different to the portfolio that was not. Research along similar lines was conducted by Marvel in 1980, where firms and industries were divided into collusive and competitive subsets to determine if certain differences in the rates of return could be identified between these subsets. The research found that certain homogeneity of profitability exists across these subsets, but also identified certain measurement problems.

It is envisaged by the researcher that the outcome of the stipulated hypothetical analysis will provide an updated review of the research conducted by Marvel (1980). The results will also contribute towards further evidence regarding the impact of regulatory fines on shareholder returns.

1.4 Conclusion to Research Introduction

The identified research objectives are all aimed at providing sufficient data to determine if regulatory fines impact shareholder returns, at what stage of the enforcement process does the most significant impact occur, and whether the quantum of the fine outweighs the benefits of collusion. The addressing of the research question through the reaching of these objectives will allow the researcher to provide some clarity on the perception that regulatory fines have little or no negative impact on shareholder returns.

The investment portfolio analysis (longitudinal study) will further provide data in establishing if a clear distinction can be made between the identified portfolios' returns over the determined period. This analysis will allow for the addressing of the research question from an investor perspective. Leading into the literature, the impact of regulatory fines on shareholder returns will be addressed through segmenting the question into different sections, and attempting to provide findings based on the analysis of these sections through previous research.

Chapter 2 – Theory Base and Literature Review

2.1 Introduction

The theory and literature review was aimed at providing background and theory of collusion and anti-competitive behaviour, as well as analysing previous literature and findings pertaining to the subject matter and research topics, by academics and scholars in the field. The review of the theory base provided reasons why companies and people collude; what the benefits as well as negative impacts are; if collusive behaviour can be predicted; and finally analysing the overall effects on society and business.

The literature review was aimed more at the analysis of researchers' work, specifically directed at regulation, regulatory fines, shareholder returns and the overall identified impact on these returns. Further focus will be placed on regulation as an important aspect of industry and company performance; the part it plays in shareholder expectations, if any; and on other factors that influence shareholder returns.

2.2 Review of Theory

2.2.1 Reason for Collusive Behaviour

The factors affecting collusion, the reasons why contractors collude with other contractors, as well as the legal implications for the contractors and the construction industry, have long been investigated by a small number of researchers (Chotibhongs and Arditi, 2012). It was found in the model by Rotemberg and Saloner (1986) that collusion generally occurs in instances where there is evidence of unusually large demand and associated returns (Rojas, 2012), thus where the benefit is substantial enough to motivate, and in some instances appear to justify, the behaviour.

It must, however be noted that although the concentration-profit relationship is an important determining factor in collusive behaviour's feasibility, it is not the only factor contributing to its success (Marvel, 1980). In general, companies willing to be associated with, and participants in, cartel-like behaviour, are motivated by the forecasted illegal profits and potential gains from the venture, with total disregard for societal damage (Combe and Monnier, 2011).

Due to the deviation of collusive behaviour from the competitive solution, it is reasonable and acceptable that the identification of said behaviour must be

performance-based (Marvel, 1980). Some of the main motivational factors for collusion amongst firms are the sufficient valuation of future profits and lower copying costs (Martinez-Sanchez, 2011). The higher quality of copying can, however, be viewed as an obstacle to collusive behaviour (Martinez-Sanchez, 2011). The inference can thus be made that if substitution can be achieved at an affordable price, collusive behaviour is more likely to occur.

Research conducted by Chotibhongs and Arditi (2012) found that firms involved in collusive or cartel-like behaviour may increase their bid to allow other participating parties to be awarded the contract, or refrain from entering a bid at all. These actions are taken by the participating firm in anticipation of the opportunity to earn higher profits in the future or contemporaneously, depending on the level of collusion.

It was stated by Martinez-Sanchez (2011) that prices are very important in the deterring of customers to buy or trade in copies from illegal firms. In the market for piratable goods it was also found that competition may drive process up and lead to price dispersion (Martinez-Sanchez, 2011), with recent technological developments making copying of original goods easier and cheaper, which raises the question that firms might tacitly collude in said markets. Tacit collusion occurs under circumstances where firms proceed with a similar strategy, knowingly, but without explicitly agreeing thereto.

The sustainability of tacit collusion was researched by Fong & Liu (2011), who found that this type of collusion can be easily sustainable with particular reference to loyalty rewards. The reasons for the sustainability of the tacit collusion are the potential loss of future profits, the impossibility to renege on previously offered discounts, and continuous undercutting of prices (Fong & Liu, 2011).

The cause of collusive behaviour cannot solely be laid at the feet of the executive team within an organisation. The proposition exists that a major cause of scandalous and collusive behaviour worldwide, is a combination of unethical leadership, financial incentives and shareholders' expectations (Chen, 2010). Chen (2010) further explains that the motivation of CEOs to achieve greater personal gain as a result of performance bonuses can be viewed as a contributor to some of the failures noted above.

The relation between products in a specific industry also plays an integral part in the possibility of collusion amongst firms. To confirm this statement, research revealed that similarity amongst products contributes to the sustainability of collusive behaviour

within an industry (Martinez-Sanchez, 2011). The similarity of the products in the construction industry, during the preparation for the SWC 2010, was testimony to this.

2.2.2 Impact of Collusion

The coordination of companies to achieve high returns has been a concern for both researchers and antitrust authorities in the past; but although a large body of theoretical work exists on the subject, empirical analyses have proven to be difficult due to the illegal status of cartels and the confidentiality of available information (Rojas, 2012). The information providing real insight into the inner functionality of cartels and colluding firms might therefore not be available in the public domain, making it difficult to ascertain the overall impact on society and business.

Research also concluded that the actual cost to society as a result of collusive behaviour is very difficult to determine (Combe and Monnier, 2011); and the reputational damage suffered by a convicted company also remains unquantifiable. The cost of equity and debt is also influenced by corruption, and it was found that a positive correlation exists between the level of corruption and the cost of debt and equity (Baxamusa and Jalal, 2014). Companies convicted of collusive behaviour and subsequently fined do not only have to contend with the imposed sum, but also have to deal with the substantial legal cost incurred through the investigation and defence of these charges (Currell and Davis Bradley, 2012).

The argument can then be set forth that the convicted company, in a direct manner, and the shareholders, indirectly, have to contend with costs greater than the actual imposed fine. Statements have, however, been made in the media that regulatory fines must be paid from the bonus pool of the implicated department, and more specifically, the bonus pool related to executive compensation (Maitland, 2014). Many companies do, however, not show a bonus pool, but pay bonuses from profit. But the overall effect on the company remains the same.

The size of the fine can therefore not be viewed as an accurate measure of the liability incurred by the company, and the additional cost, as identified previously, must be taken into account when determining the impact. The effects of collusion on the immediate society also remain difficult to quantify, but can be viewed from the perspective of opportunity cost, where the client or customer paid substantially more for a product or service where collusion was present.

Another important factor in considering the impact of collusion is the sustainability thereof in the operating market. It can be assumed that the longer collusion has been allowed to prosper amongst companies, the greater the societal impact has been. The theoretical view exists that the introduction of asymmetry in how substitution-effects influenced the sustainability of collusion concluded that the existence of asymmetry in substitution made collusion difficult to sustain (Savorelli, 2012). These findings confirmed the research conducted by Martinez-Sanchez (2011), where sustainability of collusion is dependent on the existence of similarity amongst products in the specific industry.

The concept of product similarity is echoed by Mihai (2008), where cartels are defined as groups of companies producing or distributing similar products, setting prices and market share, allowing this behaviour to be based on the theory of cooperative oligopoly. The existence of cartels has no benefit to society and the economy, with the customer having to ultimately deal with the consequences (Mihai, 2008).

Research conducted specifically on the newspaper industry attempted to establish whether the effect of certain circumstances which allowed collusive behaviour, was beneficial to customers (Dewenter, Haucap, and Wenzel, 2011). The said research concluded that in some instances collusion amongst advertisers actually benefitted the customer, due to the fact that higher advertising revenue can cross-subsidise newspaper copy prices.

The theoretical review introduced the researcher to two terms of collusion, namely semi-collusion and full collusion. The term semi-collusion, as referred to by Dewenter et al. (2011), is defined as collusion amongst advertisers, but in full competition for readers; with full collusion being defined as collusion in both advertising and readership.

A contrasting view was also raised, stating that the deviation from competition and the motivation of semi- or full collusion within an industry, might lead to higher prices being passed onto the consumer (Dewenter et al., 2011). Therefore it can be posed, as a result of said research that in some cases semi- or full collusion might be beneficial to the customer, increasing the value received for the product or service.

The concept of “tunnelling” was also found to have a negative impact on a firm’s performance, with these tunnelling activities generally occurring as a result of collusion between controlling shareholders and executives in an organisation (Wang and Xiao, 2011). Tunnelling generally occurs where controlling shareholders obtain private

benefits from utilising their positions through self-dealing activities such as the sale of assets or products to listed companies at high prices, or transferring assets from listed companies to firms under these shareholders' control at low prices (Wang and Xiao, 2011). This research provides evidence that collusive behaviour need not only be between various companies, but can also occur internally in an organisation, affecting the performance in a negative way.

2.2.3 Predicting Collusive Behaviour

No single tool can be identified to detect potential collusive behaviour in the future, but research by Chotibhongs and Arditi (2012) proposed a two-step method for detecting collusion as well as forecasting similar behaviour. The method systematically analyses historical available data and bid information, which identifies suspected cartel-like behaviour amongst bidders.

The first step consists of the identification of potential collusive bidders using residual and cost stability tests. The second step involves the comparison of bidders guilty of collusive behaviour and non-cartel bidders, by analysing bid distributions, cost dispersion and finally the difference in cost structures (Chotibhongs and Arditi, 2012).

The method identified by Chotibhongs and Arditi (2012) cannot predict collusive behaviour due to its surreptitious nature, but it does allow for the identification of participants that have been involved in collusive activity in the past, and therefore allowing the client to disqualify the bidding party based on this information. The inference can thus be made that collusive behaviour cannot be conclusively forecasted without hard evidence, which can lead to difficulty predicting the competitive nature of bids. Companies convicted of collusive behaviour on previous occasions can, however, be more easily identifiable.

The Competition Commission of South Africa states that collusion can be detected through the displaying of suspicious bidding patterns, such as common mistakes through different bids, identical prices quoted in separate firms' bids, the failure to bid by certain contractors, and finally when the lowest bidder does not accept the contract. Furthermore, it was stated by Chotibhongs and Arditi (2012), that due to the secrecy surrounding collusive behaviour, it can only be detected through the thorough investigation of cartels and witnesses, as well as analysing abnormalities in bids.

Mihai (2008) found that cartel-like behaviour can be identified through the analysis of trends and pricing in specific markets. The research, however, cautions that the uncovering and analysis of collusive activity and information can be difficult, which might lead to failures in such a diagnosis.

Further research conducted by Rojas (2012) concluded that collusion is the highest in environments described as most-certain. These are environments where demand information is known amongst competitors, and where historical information is easily obtainable for analysis. The construction industry is a prime example of such an environment. The inverse was also found to be true in that collusion is at its lowest in least-certain environments (Rojas, 2012). Marvel (1980) found that the general pattern of rates of return varies systematically and significantly between markets operating under competitive circumstances, and markets where cartel-like behaviour was observed. Although the afore-mentioned research by Rojas (2012) and Marvel (1980) does not confirm the predictability of collusion, it determines that collusive behaviour is more likely to occur in certain types of environments, and that a difference between the returns to shareholders can be observed depending on the prevailing market environment. This information can be useful when clients are planning to put bids to the market.

2.3 Literature Review

2.3.1 Regulation and Regulatory Fines

Regulation can be defined as rules produced by administrative agencies mainly through the notice-and-comment rulemaking process (Stack, 2012). The current research explores the events where these rules have been transgressed, and a liability placed on the transgressing party or parties. It has been stated that regulation or antitrust laws are fundamental in market economics as they can be viewed as a manner of preventing companies to distort competition in ways that adversely affect the economy. Fines are crucial in enforcing these antitrust laws (Aguzzoni, Langus, & Motta, 2013).

Research conducted by Lean, Ogur, and Rogers in 1985 raised an argument that market forces can break down collusion without the interference of regulatory bodies, therefore indicating the possibility that collusion is not profitable, and that antitrust policy is ineffective and not required. The research, however, concluded that antitrust

agencies are effective in lowering high returns gained by collusive behaviour, as well as reducing social losses incurred.

Regulation followed the age of statutes, but “despite the centrality of regulation to law, courts have no intelligible approach to regulatory interpretation” (Stack, 2012). It can therefore be assumed that in some cases regulation lends itself to interpretation, and thus necessitates the existence of regulatory bodies, to assist in clearing any ambiguity that might exist. Antitrust intervention must be focused on all forms and channels of collusion in order to be effective (Lean et al., 1985); the inference can therefore be made that regulatory bodies must also be innovative and attentive to market changes to be successful.

Regulation need not only be applicable to specific industries and the way business is conducted, but it can also be applied to the way in which companies disclose information. Corporate disclosure can be viewed as a critical component of a functioning capital market, with firms providing information to shareholders and investors through voluntary communication, financials and mandated disclosures (Shi, Pukthuanthong, and Walker, 2013).

The importance of transparency enables shareholders and other stakeholders to gain sufficient knowledge of the way companies are operating and if the senior management is adhering to the required industry regulations. Transparency can therefore be viewed as an important factor in inspiring confidence amongst shareholders, as well as where these shareholders choose to invest their capital.

Mihai (2008) found that the main sectors in Europe influenced by restrictive competition in the form of collusion are chemicals and construction materials, with recent fines imposed on 10 companies by the European Commission in excess of €2.57 billion. Included amongst these companies was a South African cement producer, which was liable for a fine of €249 million for its involvement in collusion over plasterboard prices (Bodoni, 2010). In recent times, the average fine imposed by the European Union (EU) per cartel equals €116 million (Combe and Monnier, 2011).

The EU has been increasing the size of fines imposed on cartels over the past few years to deter collusive behaviour, but the concern remained amongst some analysts that there might be a risk of overenforcement (Combe and Monnier, 2011). When overenforcement or excessiveness is applied to a fine, the risk exists that a company cannot pay the imposed fine.

This inability to pay can lead to the convicted company being driven out of the market, or even bankrupted, which can in turn lead to a reduction in competition in the affected industry (Combe and Monnier, 2011). The risk of overenforcement can therefore raise the issue of responsible regulatory enforcement, and that regulatory bodies must be aware of the impact a fine can have on the immediate market.

Taking into account the afore-mentioned statement, it must be noted that only if the fines are large enough, will future anti-competitive behaviour be deterred amongst convicted and un-convicted firms (Aguzzoni et al., 2013). Therefore constant revision and innovation must be conducted by antitrust agencies to ensure that the correct liability is placed on the convicted company, to serve as punishment, but to also encourage future competition.

Another way to combat cartels is by implementing leniency policies, which allow for a reduced fine or total amnesty should cartel members provide information and confess regarding collusive behaviour (Mihai, 2008). These policies have the potential to decrease the risk of overenforcement, and may also provide the authorities with tangible data to investigate and prosecute guilty parties. Research conducted by Bigoni, Fridolfsson, Le Coq, & Spagnolo (2012), as part of a laboratory experiment, found that antitrust without leniency reduces cartel formation, but increases the remaining cartels' prices. Leniency was found to improve antitrust via a strengthening deterrence, but stabilised existing cartels, as convicted companies expected the lower fine (Bigoni et al., 2012).

To establish the impact of collusion on shareholder returns, the literature leads towards the shareholders and the expectations of returns. The concept of shareholder returns needs to be defined and analysed, to provide assistance in formulating an understanding of this impact.

2.3.2 Shareholder Return

Shareholder return, also known as total shareholder return (TSR), is a measure of establishing the overall gains in shareholder wealth as a metric (Burgman and Van Clieaf, 2012). TSR can also be defined as a comparative concept, used to compare the performance of companies' shares over a period of time. It combines the change in the share price as well as dividends paid to determine the TSR for a specific company (Jeppson, Smith, and Stone, 2009).

The view exists that shareholders' only concern is the value of the stock of the company and the amount of dividend paid (Panigrahi, Zainuddin, and Azizan, 2014). Based on this view, it can be inferred that as long as shareholders are of the opinion that the management of a company is producing expected returns, no reason exists for these shareholders to divest from the company, but it can also create a sense of expectation of continuous performance by the senior management.

In order to meet the demands of the shareholders, managers must strive to enhance their abilities and skills to exceed organisational goals and produce the expected results (Panigrahi et al., 2014). The general assumption that the compensation of CEOs is related to the TSR has been disproven by Jeppson et al. (2009). It was found that the compensation of the CEO is more likely to be linked to the size of the company, where larger companies can afford to appoint more highly paid CEOs.

Although the afore-mentioned research confirmed the link between company size and CEO compensation, it does not however de-link the relationship between improved performance and improved CEO compensation. The findings of Wang and Xiao (2011) re-confirmed the link between executive pay and firm performance, but also stated that collusive intentions by controlling shareholders decreases the incentives by these shareholders to strengthen this link.

The impact and role that shareholder expectation plays in collusive behaviour cannot be discounted, and managers are under pressure to produce above-average corporate performance on a continual basis as a result of these high shareholder expectations (Dimitrov and Jain, 2011). The research by Dimitrov and Jain (2011) further found that as a result of shareholder expectations, managers tend to produce significantly more positive cumulative abnormal returns, prior to annual shareholder meetings. These declarations attempt to satisfy the overall expectations of the shareholders. The inference can therefore be made that the pressure placed on managers to perform to certain expectations, might drive an increase in collusive behaviour.

The Dimitrov and Jain (2011) research also found that managers of poorly performing firms tend to report better-than-average performance ahead of the annual shareholder meetings, but worse-than-average management forecasts in the period after the meeting (Dimitrov and Jain, 2011). The pressure from shareholders on management might influence managers to find ways of delivering on the pre-shareholder meeting's optimistic forecasts, thereby possibly considering collusion as an option.

A view exists that from a shareholder's perspective, in order to achieve the desired returns, shareholders in general should have a more active role in the corporate governance of the companies they invest in (Renneboog and Szilagyi, 2011). To advocate this view, shareholder control might be viewed as an added regulation within the company, which might assist in mitigating collusion.

This point can be motivated by following theoretical work by Yu (2011), who poses that strong corporate governance at firm level promotes efficient incorporation of private information into stock prices. Strong corporate governance limits costs and produces more informed stock prices (Yu, 2011).

Cuñat, Gine, and Guadalupe (2012) found that shareholder activism can play a large role in creating value within a firm. This activism together with greater democracy within an organisation can have positive effects on overall shareholder value; therefore the activism by shareholders can be contributed to an increased TSR.

The overall performance of share prices is very difficult to predict by analysing the company's compliance to corporate governance (Ertugrul and Hegde, 2009). The inference can therefore be made that the market generally may not react in a predicted way to regulatory fines. Research undertaken by Yu (2011), however, states that stock returns of companies with good corporate governance policies show positive associations within the existing market as well as one-year earnings growth forecasts.

The suggestion can be made that returns might be difficult to predict based on the level of corporate governance, but that there should be a general positive inclination of stock price growth over a short-term period, should the level of corporate governance be strong within an organisation. To move the focus back to the impact of regulatory fines on shareholder return, it was found by Mihai (2008) that the fine imposed by a regulatory body on a convicted company can reach up to 10% of a company's annual turnover, a significant amount in the researcher's opinion.

It must, however, be stated that fines of this magnitude are generally reserved for cartel participation, as it is seen as the most harmful form of anti-competitive manifestation (Mihai, 2008). The impact of a fine on the TSR of an organisation can therefore be viewed as being determined using the size of the company as a main indicator.

The impact of disclosure of alleged collusive or illegal behaviour by companies on the shareholder return formed part of research conducted by Cloninger and Waller (2000).

One of the findings revealed that the initial disclosure by a company confirming its involvement in collusive or illegal practice, had a negative effect on that company's abnormal returns (Cloninger & Waller, 2000). In some instances these negative abnormal returns exceeded the fines ultimately incurred by the companies. The research by Cloninger & Waller (2000) can therefore be used by the researcher to compare the findings.

Moving the focus of the research slightly to the EU and the conduction of antitrust investigations within the limits of its authority has brought certain revelations to the fore. An empirical study, using event study methodology conducted by Aguzzoni, Langus, & Motta (2013) found that, on average, a surprise inspection can reduce the share price of the identified company by approximately 2.8%, with conviction having an impact of approximately 3.5%. In total it was found that antitrust action in general negatively impacted the firm's market value by approximately 3% to 4.5% (Aguzzoni et al., 2013). The current research, focusing on companies listed on the JSE, will further this study to determine the impact of regulatory fines on shareholder returns in a South African context.

Further research conducted on the electrical equipment manufacturing industry, to establish if the existence of collusion increased the returns to the shareholders of these companies, found that the existence of collusion indeed increased the relevant returns to these shareholders (Lean et al., 1985). Although the increased returns were centralised to certain sectors and products of the industry, it provided evidence that collusive behaviour can in fact be profitable in nature and affect the returns to shareholders in a positive manner. This finding also contradicted the original argument by the same researchers stating that collusion is not profitable.

2.4 Conclusion to Theory Base and Literature Review

The theory and literature review conducted by the researcher has provided better clarity on the theory of collusion, and why collusive behaviour occurs in business, the effects of collusion, as well as analysing the predictability of collusion in the market. The findings revealed by the said review stated that collusion might be driven by the expectation of higher than the norm future profitability (Rojas, 2012).

The effects of collusion on society also remains difficult to quantify, but the inference can be made that cost and prices are generally higher in markets where collusion is present compared to markets where collusion does not exist (Combe and Monnier,

2011). Finally, the theory established that although the industries where collusive behaviour is more likely to be present can be identified, the actual behaviour is difficult to predict (Chotibhongs and Arditi, 2012).

The literature described that the existence of regulation across various industries, as well as the magnitude of fines imposed on companies convicted of transgression (Mihai, 2008). The impact of overenforcement was also analysed, as well as the consequence it has on the market and the specific company (Combe and Monnier, 2011). The concept of TSR was identified and discussed, as well as factors influencing shareholder return (Burgman and Van Clieaf, 2012). The long-term impact of regulatory fines on share prices was investigated by Aguzzoni et al. (2013) and a proposal was made by the researchers that the market anticipates profits to be lower after antitrust action, due to the fact that anti-competitive behaviour will cease within an convicted organisation.

The gap in knowledge – identified by the researcher - motivating the need for the current research, is that the impact of regulatory fines on shareholder return is not addressed directly in any of the reviewed literature. The impact of collusion on shareholder return was introduced to the current research by Lean et al. (1985) with a general consensus that collusion affects profitability in a positive manner, but the effect of fines on the same level was not addressed. Therefore, the findings of the proposed research can provide suitable information to potentially fill this gap.

Chapter 3 – Research Questions

3.1 Main Research Question

The main research question identified by the researcher through the theory and literature review, as well as the business rationale stated in the recent media, is:

- Do regulatory fines have an impact on shareholder returns?

In the attempt to answer the research question, the researcher will be analysing all factors that have resulted in organisations being subjected to regulatory fines, as well as the reaction of the market to said fine.

3.2 Supporting Research Questions

Further to the literature review, the researcher identified certain supporting research questions, which will assist in concluding findings to address the main research question. These sub-questions are:

- Do different industries react differently to the announcement of regulatory fines for companies in these industries?

- Is the quantum of the imposed fine sufficiently large to deter companies of repeat transgression?

- Will companies convicted of regulatory transgressions perform better in the market than companies never found guilty and fined over a substantial period of time?

Chapter 4 – Research Methodology and Design

4.1 Sampling and Data Collection

The population identified for the current research are all companies listed on the Johannesburg Stock Exchange (JSE), with the sample being all of the companies investigated and fined by a regulatory body for collusive or anti-competitive behaviour. The sampling technique used for the current research is non-probable quota sampling. This technique allows for the identification of companies across different sectors of the JSE, and it will ensure that compliance to all of the predetermined characteristics is met.

Quota sampling is defined as a technique which ensures that the selected sample represents the characteristics as required and selected by the researcher (Saunders and Lewis, 2012). The characteristics of the companies required for the research are:

- The requirement that all companies included in the research must be listed on the JSE, during the period of the identified event.

- The requirement that the selected companies, at some point in time, have been the subject of an investigation by the Competition Commission of South Africa or any other regulatory body for collusive behaviour.

- The requirement that the selected companies have been convicted and subsequently fined by the regulatory body conducting the investigation.

The data will be secondary and quantitative in nature and will focus on the share price value and the expected change in this value after the announcement of the catalyst. The numerical data will be continuous in nature, and will take into account the value of the share prices for periods prior to and after the event.

The required data will be accessed via the published information on the JSE of all listed companies convicted of collusive behaviour from 1998 to the current date. The identified commencement date coincided with the formation of three independent regulatory bodies, replacing the Competition Board, which historically was not independent of the Ministry of Trade and Industry and only possessed advisory powers. These bodies are listed as the Competition Commission of South Africa (the

commission), the Competition Tribunal (the tribunal) and the Competition Appeals Court (the appeals court).

The commission serves as the investigative and enforcement agency, with the tribunal serving as the adjudicative body. Finally, the appeals court considers appeals against rulings passed by the tribunal ("About," 2010).

The identification of the companies will be done via publicly available information from the tribunal, which will be analysed to establish a list of companies investigated by the commission and adjudicated by the tribunal. This list will enable the identification of an approximate date of an investigation announcement as well as a date recording when the company was convicted or acquitted. The final event in the time-line will be the imposing of the fine and the subsequent payment by the company.

The final step in the data collection process will be the review of the available documentation and consent orders on the tribunal's website. This published documentation will provide detailed information regarding the relevant dates of the regulatory fine process, as well as the value of the fine and further detail surrounding the transgressions by the companies. The dates included in the tribunal documentation will be viewed as the catalyst events in determining the impact on the share price and ultimately the shareholder return. The data will be analysed in the time preceding and following these events, to establish if a change (positive or negative) can be identified in the company's share price through the cumulative abnormal returns of the stock.

4.2 Data Analysis

The collected data will be analysed using the event study methodology, to determine if there were any notable changes in the abnormal returns of the share prices of the companies identified in the sample. The event study will focus on the announcement date of the fine as well as the date the companies had to pay the imposed fine. This allows for the determination of whether one of these events can be viewed as more significant in terms of the change in abnormal returns of the companies, than the other.

The second tool for analysis will be the use of a style analysis. The style analysis will allow for the determination of a specific investment style of investors in the convicted companies, and whether these styles influence the impact of regulatory fines on the returns of these investors. The type of investor as well as the investment style might have an effect on the share prices of the identified companies. The perception exists

that the market effectively prices in the risk of the fine after the announcement date, and that returns might not be influenced when the actual fine is paid and the cost incurred. The style analysis in this instance will be used as a post-hoc tool to analyse the effects after the catalyst event, owing to the fact that investing in companies which collude is not viewed as a normal investment style and it cannot be predicted.

4.2.1 Event Study

The definition of an event study according to the *National Association of Securities Dealers Automated Quotations* (NASDAQ), is that it refers to a statistical study on how information affects prices at a specific time (Harvey, 2011). An event study can further be defined as an empirical study performed on a security which has experienced a catalyst occurrence, and had changed in a positive or negative way as a result of the catalyst.

The catalysts in the current research referred to the three determined and identified dates, namely the date of investigation, the date of conviction or acquittal, and finally when the fine was paid by the convicted party. This methodology allows for the analysis of any changes in the relevant share prices of the companies, and thereby for the determination of the impact of the fine on the shareholder return.

To provide some context to the findings which might be expected by the application of the event study methodology, research conducted by Wai Kong Cheung (2011) has reference. The research was specifically aimed at the Dow Jones Sustainability World Index and the impact on stock return of firms included or excluded (the catalyst) from the Index. It was concluded that little or no impact on the stock returns followed the initial announcement, but that on the date of the catalyst, the returns experienced significant but temporary positive or negative effects (Wai Kong Cheung, 2011). Therefore concluding that the market reaction might not be visible on some of the dates, identified for analyses, and secondly the reaction might be temporary and not influence the long term returns of the shareholders.

An example of the methodology for an event study model refers to Ward and Muller (2010) who published research findings, using event study methodology pertaining to the impact of Black Economic Empowerment (BEE) on specific companies listed on the JSE. The research stated that a variance in the reaction of the market to the identified event could be observed. The catalyst in the said research was the influence of equity ownership through BEE deals. It was concluded that a difference in market

reaction was witnessed specific to the size of the company. Smaller companies (market capitalisation less than R3.5 billion) reacted in a positive manner to the announcement, but larger companies' share prices reacted slightly negatively. The said research (Ward and Muller, 2010) used the concept of abnormal returns (AR) to determine the market reaction to the described catalyst. Although the results and findings are not relevant to the current research, the methodology used will be applied to the collected data to determine the regulatory fine's impact on the company's share price.

Research found that AR can be positively influenced by the adoption of good corporate governance proposals, with shareholder value increasing by as much as 2.8% (Cuñat et al., 2012). The focus on cumulative abnormal returns (CAR) after the catalyst forms an important part of the current research.

Generally, CAR behaviour is examined over multiple days surrounding the event date, with the allowance of the possibility that the exact date is not known and that it allows for the capture of post-event market reaction (Kolari and Pynnönen, 2010). By applying the CAR principle to the determined dates of the announcement, and the imposing of the regulatory fine, the impact on shareholder return after these catalysts can be determined and will allow for the determination if any significant changes occurred as a result of these events. For the purposes of current research, a timeline of 22 working days, pre and post the event will be analysed to establish if a clear impact can be determined. The event study model will exclude all non-trading days and therefore the 22-day period can be viewed as a full month pre and post the event.

Further research conducted by Cloninger and Waller (2000), using event study methodology, found that the betas of companies convicted of illegal activities can also fundamentally change after the disclosure date. The methodology used by these researchers applied two 100-day calculations (negative days and positive days) taking into account the pre- and post-disclosure betas. As mentioned previously, this methodology will be similar to the current model used by the researcher to do the tests for the current research, but with a reduction in the days to 22.

4.2.2 Style Analysis

The concept of a style analysis can be defined as a process of determination, to establish a specific type of investment behaviour employed by investors when making investment decisions. The idea of a style analysis according to *Barclay Hedge* is to

explain the set of returns of a specified fund with the reference to a set of style factors or behavioural indicators ("Style Analysis," 2014). The purpose of its development was to determine a mutual fund's investment style (Domian & Reichenstein, 2008).

The issue of style is of particular importance in establishing a particular investment pattern of a fund manager, and can also be used as a performance management and measurement tool for the particular manager (McDermott, 2009). The relevance to the current research is that the data can be analysed with particular styles of shareholders investing in the identified companies as parameters in determining specific investment styles.

The fields of application for style analysis methodology are identified as performance, evaluation, risk management and classification (Swindler and Oehler, 2006). All of which can be viewed as examples of independent and different styles.

Muller and Ward (2013) conducted research on JSE-listed stocks over a period from 1985 to 2011, with the aim to re-examine existing styles via the use of an improved data set, due to the fact that some of the data sets suffer from too-short time frames, too-long review periods, survivor bias and incomplete data. The styles identified by Muller and Ward (2013) were grouped into financial ratio-based styles (return on capital, return on equity, interest cover and net asset growth), market-based styles (size, price to net asset value, dividend yield, industry, earnings yield, cash-flow/price, liquidity) and behavioural finance-based styles (momentum). The researchers also added a combination style for analysis, consisting of the best-performing style and then adding the styles contributing the most to the results.

The research by Muller and Ward (2013) concluded momentum to be an important style with persistent out-performance of the All Share Index (ALSI) during the time under review. The combination style however performed the best and outperformed the ALSI by 14% p.a. (Muller and Ward, 2013). The combination style consisted of momentum, return on capital, cash-flow to price and earnings yield.

Taking the research by Muller and Ward (2013) into account, the researcher will apply the style engine to the investment portfolio analysis. The conviction of a company and the subsequent fine will be the basis of the style.

It can therefore be inferred that the style engine will be able to establish the returns of a company's stock over a specific period given the identified style, which will enable the researcher to test the long-term performance of convicted companies versus

companies not found guilty or never investigated. This methodology will be implemented as a part of the Investment Portfolio Analysis, described in detail below.

4.2.3 Investment Portfolio Analysis

The data collection and analysis of the investment portfolios as stated earlier in the research will be conducted as follows:

The initial portfolios will be constructed, using the same number of companies per industry over the same time period. The time period identified for this analysis will exceed the time-frame identified for the main research question, and will aim to span a 25-year period, commencing in 1989. The reason for this extended time period is that the researcher aims to test the return of these portfolios over a sufficiently long time frame and allow for investment in the portfolio consisting of convicted companies without prior knowledge of the regulatory fines available in the market.

These portfolios will then be increased by the addition of companies which were listed on the JSE after 1989. The same criteria regarding the initial portfolio will be applied to all subsequent portfolios.

The comparison will be aimed at providing two main findings. The first finding is to establish which portfolio performed better over the identified time period, and the second finding aims to ascertain the performance of these portfolios against the ALSI for the time period. These findings will provide evidence of performance against a benchmark (ALSI) contributing towards CAR.

The style analysis (style engine) will be constructed and utilised to compare and analyse the performance of the convicted companies versus those that have never been convicted of collusive behaviour. No alternative variables will be taken into account in conducting the analysis and the companies will only be differentiated by the conviction and subsequent fine. The style engine will be utilised as part of the portfolio analysis and refers to the methodology of analysis included in the current research.

4.3 Limitations of Current Research

Although the researcher will aim to be as comprehensive as possible whilst conducting the research, it must be noted that some limitations have been identified. These limitations to the research are listed as the following:

- Although the literature review was aimed at providing a theory base using international journals specific to the subject matter, the data analysis will only be conducted on companies listed on the JSE, thereby limiting the population base.

- No expert interviews will be conducted as part of the current research, thereby providing opportunities for further research from a qualitative perspective in this area.

- The exact dates of the catalysts identified as part of the event study analysis might be difficult to determine, which might have an influence on the results.

- The problem of sample selection. There may be other companies which collude, but have not yet been investigated and/or fined, thereby limiting the research only to the convicted companies.

The identified limitations provide the context in which the findings must be viewed and also allow opportunities for future research. As part of the results analysis, the areas where the limitations might in any way potentially influence the stated results, the researcher undertakes to qualify these results clearly.

Chapter 5 – Results

5.1 Introduction

The research results have been divided between the events and the hypothetical portfolio analysis. The findings will be stated under the current chapter, with a detailed analysis following in the subsequent Chapter 6.

5.2 The Events

Verifiable events of tribunal fines have been included in this section of the research. The concluded cases listed on the website of the tribunal provided the required substantiation for event inclusion, and where applicable, written media have been referenced to provide greater description and clarification of the identified events.

The event can be divided into three sub-events. The three specific dates can be described as the initiation date, which is the date the investigation was initiated against the specific company. The conviction date, which is similar to the date of the consent order issued by the tribunal, is the second identifiable date, followed by the payment date, the third sub-event. The payment terms in certain instances are split into instalments, providing the convicted company an extended period to pay the imposed fine. For the purposes of the current research, the first instalment date will be used as the payment date.

The research identified 12 companies which meet the requirements as stipulated in Chapter 4 of this document. The number of events identified is 23, with subsequent sub-events equal to 69. The fines ranged from R0.115 million to R3.7 billion and include companies from the Oil and Gas, Construction and Materials, Food and Beverage, Telecommunications and Banking sectors on the JSE. The companies identified as well as a brief description of the events and sub-events are stated below.

5.2.1 Aveng Group Limited

Aveng Group Limited (Aveng) was fined during 2009 as a result of collusive behaviour by its business unit Infraset, related to concrete products (culverts and pipes) manufactured by the unit. The value of the fine was R46.3 million which equates to 8% of Infraset's turnover for the period ("Aveng fined R46m for collusion," 2009).

The commission initiated an investigation into the alleged cartel activity on 19 March 2008 (the initiation date). The consent order was passed on 25 February 2009 (the conviction date), with the payment split between three equal sums, the first being no more than 30 days from the conviction date (the payment date) and the remaining two on 28 February 2010 and 2011 respectively ("Competition Commission and Aveng. Case No 24/CR/Feb09," 2009).

In addition to the afore-mentioned conviction and fine, Aveng was also investigated and convicted on various historical anti-competitive practices, some related to the SWC 2010, in which various other construction companies suffered a similar fate ("Aveng reaches R306m settlement with Competition Commission," 2013). The value of the fine was approximately R306.6 million and payable in three installments.

The commission initiated the investigation into the alleged collusive practices in the construction industry on 10 February 2009 (the initiation date). The tribunal passed the consent order on 21 June 2013 (the conviction date) and the payment terms consisted of three equal installments, the first of which was payable on 1 July 2013 or within 30 days from the consent date (the payment date). The second and third instalments are due on 1 July 2014 and 1 July 2015 respectively ("Competition Commission and Aveng. Case No 016931," 2013).

The third event identified by the researcher, involved the fining of Aveng by the commission for its involvement in cartel-like behaviour in the wire mesh and reinforcing steel rebar business. Aveng's subsidiary, Steeledale, was implicated in the cartels and a fine of R128.9 million was imposed during 2011 ("Aveng to pay R128,9m collusion fine," 2011). The fine was equal to 8% of Steeledale's turnover for the 2008 financial year.

The complaint was initiated on 26 January 2009 by the commission (the initiation date), with the consent order passed by the tribunal on 6 April 2011 (the conviction date). The payment of the fine was to be in four equal instalments over a 24-month period. The first payment had to be made within seven days of the consent order (the payment date), with the final three instalments payable within eight-month intervals ("Competition Commission and Aveng. Case No 84/CR/Dec09 and 08/CR/Feb11," 2011).

The final event identified by the researcher involves Duraset, a subsidiary of Aveng. The event commenced through an investigation by the commission into an alleged mining roof bolt cartel on 8 September 2008 (the initiation date). After the investigation

Duraset pleaded guilty to collusive tendering for mining roof bolts and the consent order was passed by the tribunal on 25 August 2010 (the conviction date). The fine was set at R21.9 million and constituted 5% of Duraset's turnover for 2008 ("Competition Commission and Aveng. Case No 65/CR/Sep09," 2010). The payment date was set to 90 days after the date of the order, placing it around the mid to end of November 2010.

5.2.2 Basil Read Holdings Limited

Similar to Aveng's second event, Basil Read Holdings Limited (BR) was part of the group of companies investigated by the commission for collusion related to the SWC 2010 infrastructure. BR was fined approximately R95 million by the tribunal when convicted (Maboja, 2013).

The initiation date of the investigation was 10 February 2009. The conviction date can be viewed as 22 July 2013, the date the consent order was issued by the tribunal. The payment of the fine was agreed to be in two equal portions of approximately R47.5 million, with the first payable 30 days after the order date, and the second 12 months after the first payment ("Competition Commission and Basil Read. Case No 016949," 2013).

5.2.3 Esor Limited

Esorfranki (Esor) formed part of the group of companies investigated by the commission on allegations of collusion related to the construction of infrastructure pertaining to the SWC 2010. The company was handed the smallest of the fines imposed by the tribunal on the convicted companies, and was only liable to pay R115 850, which is substantially lower than the other convicted companies (Venter, 2013). Esor was only found guilty on one matter, which explains the lesser fine.

The initiation date of the investigation was 10 February 2009 with the consent order passed by the tribunal on 22 July 2013 (the conviction date). The payment terms reflected full and final settlement within 30 days from the consent order, 22 August 2013 (the payment date) ("Competition Commission and Esorfranki. Case No 016956," 2013).

5.2.4 Murray and Roberts Holdings Limited

During 2013 Murray and Roberts Holdings Limited (MR) agreed to pay a R309 million fine as a result of bid rigging. MR formed part of the group of construction companies which was fined collectively in excess of R1.46 billion as a result of market collusion related to contracts awarded for infrastructure and stadium construction for the SWC 2010 (Allix, 2013b).

The initiation date of the investigation was 10 February 2009, with the tribunal issuing the consent order on 22 July 2013 (the conviction date). The payment of the fine was split into three installments with the first being 30 days after the consent order issuance (the payment date), the second and third payments are to be made 12 months after the first and second payment respectively ("The Competition Commission and Murray & Roberts Li. Case No 017277," 2013).

5.2.5 Pioneer Food Group Limited

During the first quarter of 2010 Pioneer Food Group Limited (PFG) was fined by the tribunal for its role in a bread cartel through its subsidiary Sasko. This cartel included other companies like Tiger Brands, Premier and Food Corp, and focussed mainly on the Western Cape ("Pioneer Foods fined R195m for cartel role," 2010). After the fine was imposed, the tribunal stated that this was the maximum penalty it was entitled to levy for the offence, which was approximately 10% of Sasko's turnover in the Western Cape and national. The total amount of the fine was approximately R195.7 million.

The complaint was initiated by the commission during December 2006 (the initiation date), the consent order was issued on 3 February 2010 (the conviction date), with payment following 20 business days after the order (the payment date) ("Commission and Pioneer. Case No 15/CR/Feb07," 2010). Due to the fact that PFG only listed on the JSE during 2008, the initiation date will be listed as an event, but will not form part of the analysis and the event study model. No share data was available in 2006 and therefore the inclusion of the event in the model will not produce accurate results.

During the same year, PFG was fined R500 million for its part in anti-competitive and cartel-like behaviour in the maize milling industry. The commission originally sought a fine to the amount of R3.2 billion or 10% of Pioneer's 2009 turnover, but the tribunal reduced this fine after negotiations with the company ("Pioneer slapped with R500m in fines," 2010). The fine would be payable in three installments.

The initiation date of the investigation was 14 March 2007, with the consent order being passed on 30 November 2010 (the conviction date). The payments were to be made in three installments, with the first being 5 days after the order date (the payment date) to the value of R66.6 million; the remaining two installments were to be settled in two equal values of R216.6 million, 12 months and 24 months respectively, after the conviction date ("Competition Commission and Pioneer (Consent Order). Case No 15/CR/Mar10," 2010). Similar to the first event, the initiation date was prior to the listing of PFG on the JSE, and therefore the same criterion applies as per the previous PFG event.

5.2.6 Raubex Group Limited

Raubex Group Limited (Raubex) was part of the group of construction companies investigated and convicted by the commission and tribunal as a result of anti-competitive behaviour relating to the construction of several infrastructure projects related to the SWC 2010 ("Construction companies fined R1.5-bn," 2013). The value of the imposed fine was R58.8 million.

The initiation date of the investigation by the commission was 10 February 2009, with the consent order issued by the tribunal on 22 July 2013 (the conviction date). The payment date was 30 days after the conviction date, around 22 August 2013 ("Competition Commission and Raubex. Case No 017012," 2013).

5.2.7 Rand Merchant Bank, a division of First Rand Bank Limited

The commission initiated a complaint against Rand Merchant Bank (RMB) during October 2008 following allegations of price fixing and fixing of trading conditions in the grain market. It was found that RMB and NWK entered into a vertical agreement regarding the storage and sale of grain, which divided markets and allocated territories. The tribunal issued the consent order on 14 July 2011 (the conviction date) to the value of R2.1 million or 3% of the value of the grain affected ("Competition Commission and Rand Merchant Bank. Case No 44/CR/Jun11," 2011). The payment date was agreed to be 60 days after the issuance of the consent order by the tribunal.

5.2.8 Sasol Limited

During the first half of 2009 Sasol Nitro, a division of Sasol Chemical Industries, was fined approximately R251 million for collusive conduct with two other companies ("Tribunal confirms R251-million fine for Sasol," 2009). The original agreement between the parties proposed a fine of R188 million, but this was increased after various other disclosures were made by Sasol.

The complaint was referred to the commission by a third party on 3 November 2003 (the initiation date), with the tribunal issuing the consent order on 20 May 2005 (the conviction date). Full and final settlement of the fine was to happen 60 days after consent order (the payment date) ("Commission and Sasol. Case No 31/CR/May05," 2009).

The second event identified by the researcher confirmed that Sasol was fined in excess of R111 million for anti-competitive behaviour in its Polymers unit during the first quarter of 2011. It has been reported that a supply agreement between Polymers and another firm, Safripol, resulted in indirect price fixing. The fine constitutes 3% of Sasol Polymers' 2009 turnover ("Sasol slapped with another huge fine," 2010).

During October 2007 the Department of Trade and Industry (DTI) requested the commission to open an investigation into the polymers industry. After a preliminary analysis the commission initiated an investigation on 12 November 2007 (the initiation date). The consent order was issued by the tribunal on 24 February 2011 (the conviction date), with the payment date being 60 days from the consent order ("Competition Commission and Sasol. Case No 48/CR/Aug10," 2011).

The third event involving Sasol occurred during 2014 when the tribunal imposed a fine of R534 million on Sasol for excessive pricing of local customers for propylene and polypropylene, key ingredients in plastic products (Crotty, 2014). The tribunal also ruled that Sasol must sell these products at the same factory price to all customers.

The initiation date can be established as August 2007 when the DTI lodged a complaint with the commission. The order was issued on 5 June 2014 (the conviction date), with payment expected 90 days after the order (the payment date) ("Competition Commission v Sasol Chemical Industries. Case No 011502," 2014). For the purposes of accurate data analysis, the payment date as established in this event will be noted, but excluded from the event study model, due to the fact that payment will incur on a future determined date, and no data is available at the present moment to provide

substantiation to the test. The “cut-off” date in terms of the current research can be viewed as the first week in June 2014.

The final event involving Sasol, occurred during 2008 when Sasol was amongst nine petrochemical companies fined in excess of €676 million for forming what the European Commission referred to as a “paraffin mafia”, after evidence concluded price-fixing and monopoly gain in the wax business (Taylor, 2008). This was the fourth largest fine ever imposed by regulators on a sector, with the largest being €992 million on elevator companies in 2007. Sasol’s portion of the fine was €318.2 million (R3.7 billion) which was the largest of all the convicted companies (Taylor, 2008). The fine was paid in full in 2009, but Sasol made a clear indication that it would appeal the fine as it believed the liability to be excessive (Pickworth, 2014). This appeal gained success as the European General Court reduced the fine to only €149.98 million on 11 July 2014.

For the purposes of the current research, the initiation date can be established as April 2005 (“Antitrust: Commission fines wax producers 676 million euros for price fixing and market sharing cartel,” 2008), with the conviction date set as 1 October 2008. The payment date can be viewed as January 2009 (“Positive Actions. Annual review and summarised financial information 2009,” 2009).

5.2.9 Stefanutti Stocks Holdings Limited

Stefanutti Stocks Holdings Limited (Stefanutti) was one of the companies convicted and fined by the commission for collusive behaviour as a result of contracts related to the SWC 2010. The total fine to the companies equalled R1.46 billion, with Stefanutti’ s portion being approximately R307 million. The fine was imposed during 2013 (Allix, 2013a).

The initiation date of the investigation was 10 February 2009, with the consent order issued by the tribunal on 22 July 2013 (the conviction date). The payment of the fine was split into four sections, with the first payment of R69 million to be made within 30 days of the order date (the payment date). The second and third payments, equalling R69 million each, were to be made 12 months after the first and second payment respectively. The final payment of R110 million, which includes 10% interest, will be paid 12 months after the third payment, releasing Stefanutti from the liability only in 2016 (“Competition Commission and Stefanutti Stocks. Case No 017038,” 2013).

Another event involving Stefanutti in collusive behaviour was identified by the researcher, where the company was fined approximately R56 million as a result of further tender collusion not disclosed during the fast track process initiated by the commission during 2013 (Allix, 2013a). This event had specific reference to the tenders submitted for the Durban Undersea Tunnel project.

The commission initiated an investigation into the alleged collusive behaviour on 22 July 2009 (the initiation date). The consent order was passed by the tribunal on 1 August 2013 (the conviction date), with payments split into four portions. The first payment of R12.55 million was to be made within 30 days of the consent order (the payment date), the second payment of similar value on the anniversary of the first payment, the third payment of R12.56 million 12 months after the second payment, and the fourth and final payment of R20.02 million (including 10% interest) to be made on the anniversary of the third payment ("The Competition Commission and Stefanutti Stocks. Case No 017525," 2013).

5.2.10 Telkom SA Limited

During 2012 Telkom SA Limited (Telkom) was handed an order by the tribunal to pay a fine as a result of abusing its dominance in the market and making its downstream competitors less competitive during the period from 1999 to 2004. This fine was to the value of R449 million and constituted 5% of the company's then market capitalisation of R9 billion, or two-and-a-half times its operating profit during the financial year ending 31 March 2012 ("Telkom agrees to pay R449m fine for 'abusing its dominance,'" 2013).

Although this conviction was not as a result of collusive behaviour, it is relevant to the current research as it displayed anti-competitive behaviour which adversely influences the market. The initiation date of the investigation was 24 February 2004, with the consent order issued by the tribunal on 7 August 2012 (the conviction date), the payment was split into two 50% portions with the first being six months after the order, 7 February 2013 (the payment date) and the balance 18 months after the order date on 7 February 2014 ("Competition Commission and Telkom SA Ltd. Case No 11/CR/Feb04 (003855)," 2012).

The second event identified by the researcher refers to the fine imposed on Telkom by the tribunal for similar practices as identified in the afore-mentioned event, but this time focused on the internet market during 2005 to 2007. The value of the fine was R200

million and was imposed upon the company during the third quarter of 2013 (Odendaal, 2013).

The matter was brought before the tribunal on 26 October 2009 (the initiation date), with the consent order issued on 18 July 2013 (the conviction date). The payment was split in three evenly sized portions, of which the first would occur on or before 18 August 2013 (the payment date), the second payment would be no later than 12 months after the conviction date, with the third being 12 months after the second ("Competition Commission and Telkom. Case No 016865," 2013).

5.2.11 Tiger Brands Limited

Following complaints during December 2006 by bread distributors in the Western Cape regarding alleged bread and milling cartels, an investigation was undertaken by the commission, and Tiger Brands Limited (TBS) was found guilty of price fixing in the bread industry, along with Premier Foods and Pioneer Foods ("Tiger Brands slapped with R98m cartel fine," 2007).

The commission initiated the complaint during December 2006 (the initiation date), served the consent order on TBS on 9 November 2007 (the conviction date) after which TBL committed to payment within 30 days (the payment date) ("Commission and Tiger Brands. Case No 15/CR/Feb07," 2007). TBS was fined approximately R98 million or 5.7% of its national bread turnover for 2006 ("Tiger Brands slapped with R98m cartel fine," 2007).

The second event investigated under TBS involved the fining of one of its subsidiaries, Adcock Ingram Critical Care (Pty) Ltd (AICC). During 2005 the commission undertook an investigation into the alleged collusive tendering and division of the private hospital market by AICC ("Competition Commission and Adcock Ingram. Case No 20/CR/Feb08," 2008). The case was referred to the tribunal on 11 February 2008 after which the terms and conditions of the consent agreement was discussed with TBL as the holding company.

The consent order was signed by all parties on 9 May 2008. AICC confirmed that it would pay the fine of R53.5 million, 8% of its 2007 turnover, within 30 days of the order ("Tribunal confirms Adcock fine," 2008). The dates for the purpose of the research, to establish if the fine had an impact on the shareholder returns of TBS, the holding

company, are 11 February 2008 (tribunal initiation date), 09 May 2008 (conviction date) and the days surrounding 09 June 2008 (payment date).

5.2.12 WBHO Limited

WBHO Limited was fined approximately R311 million by the commission as part of a large scale investigation into collusive tendering, as a result of contracts related to the SWC 2010 (Clark, 2013). The fine constituted 3.9% of turnover and was the largest fine imposed by the tribunal of all the convicted construction companies for similar offences during the same period.

The investigation by the commission into alleged collusive practices as a result of SWC 2010 contracts was initiated on 10 February 2009 (the initiation date). The consent agreement was concluded on 24 June 2013 (the conviction date), with payment following in three equal installments - the first being 30 days after the consent agreement (the payment date), the second 12 months after the first, and the third 12 months after the second ("Competition Commission and WBHO Construction. Case No 017061," 2013).

Identified as a second event for the purpose of the current research, WBHO was fined R10.2 million by the commission - 0.3% of its civil engineering sub-sector turnover for 2010 - after admitting to collusive tendering on the Sishen-Saldanha (SS) railway project (Slabbert, 2014). The collusion amongst WBHO and other construction companies occurred during November 2006, after eight companies were invited by Transnet to tender on earthworks, track laying and overhead traction equipment on the SS project (Cokayne, 2014).

The commission initiated an investigation into the alleged collusive tendering practices by WBHO and various other companies on 16 July 2009 (the initiation date), the consent order was issued by the tribunal on 9 April 2014 (the conviction date) and payment was due within 30 days from this order (the payment date) ("Competition Commission and WBHO Construction (Pty). Case No 18549," 2014).

5.3 Event Results

For ease of reference in the current research, the researcher will be referring to the identified companies in the form of their share code listed on the JSE. Table 1 details the company name and relevant share code. The share codes were sourced from the JSE website ("Find an equity issuer," 2014).

Table 1: Company Name and JSE Share Code

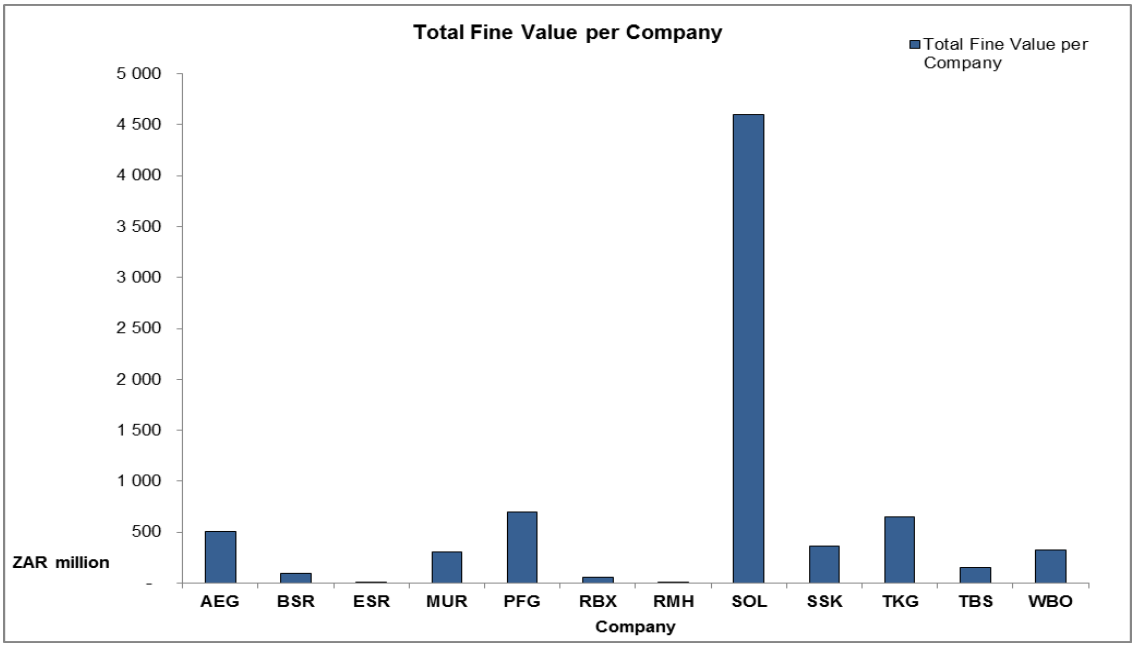
Company Name	JSE Share Code
Aveng Limited	AEG
Basil Read Holdings Limited	BSR
Esor Limited	ESR
Murray & Roberts Holdings Limited	MUR
Pioneer Food Group Limited	PFG
Raubex Group Limited	RBX
RMB Holdings Limited	RMH
Sasol Limited	SOL
Stefanutti Stocks Holdings Limited	SSK
Telkom SA SOC Limited	TKG
Tiger Brands Limited	TBS
Wilson Bayly Holmes-Ovcon Limited	WBO

Source: www.jse.co.za

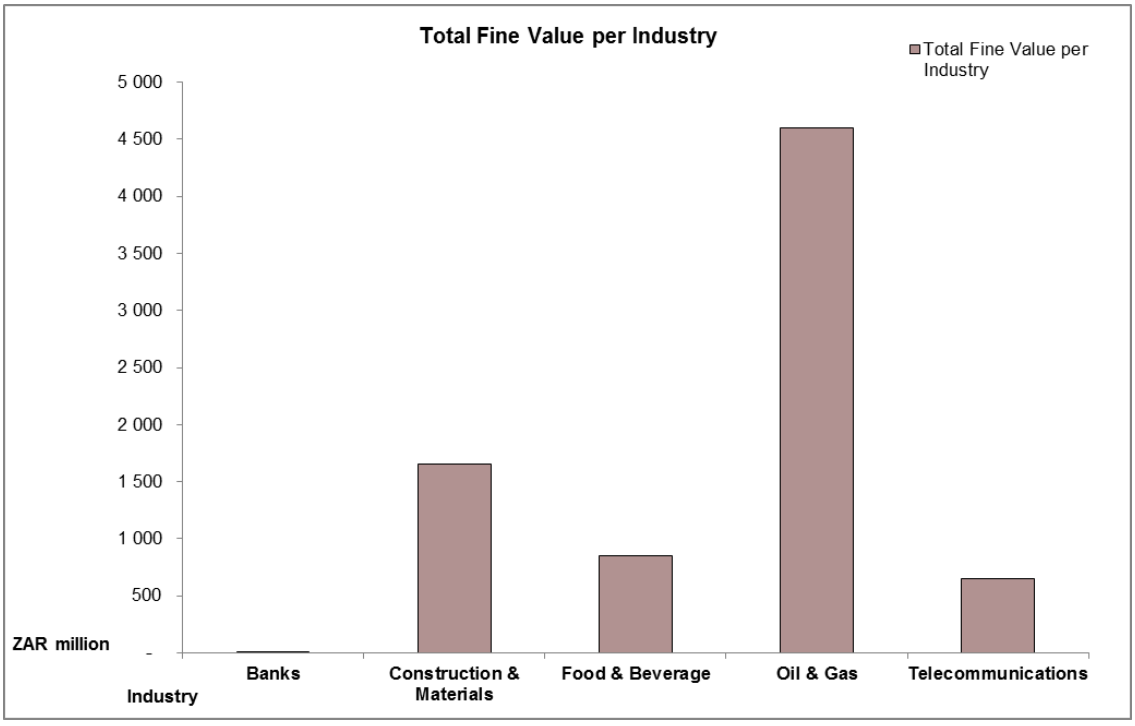
The total value of the fines imposed on the convicted companies referred to in the current research is R7.75 billion. These fines were imposed and paid over a period of 10 years, from 2005 to 2014. SOL received the biggest collective fine, totalling R4.6 billion, with ESR incurring only R0.12 million. Graph 1 illustrates the total fine value per convicted company.

Graph 2 divides the companies into the specific industries and reflects the total value of fines per industry. The convicted companies can be divided into five different industries, namely Banks, Construction & Materials, Food & Beverage, Oil & Gas and Telecommunications. Due to the magnitude of fines imposed on SOL, the Oil & Gas industry remains the hardest hit by fines, with the Banking industry being the lowest.

Graph 1: Total Fine Value per Company

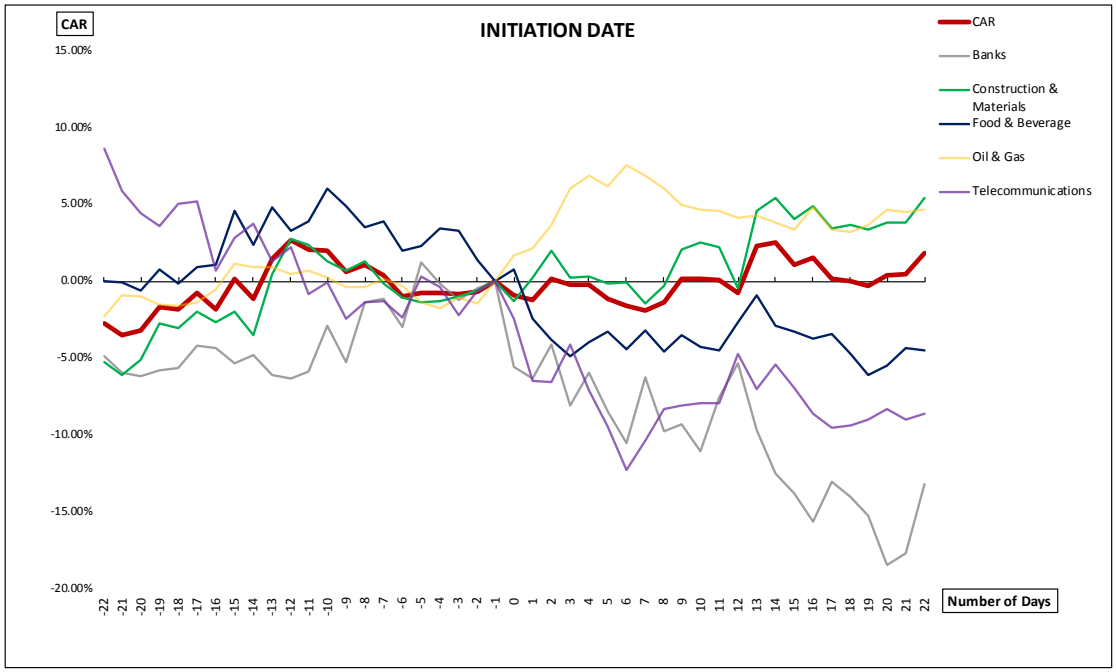


Graph 2: Total Value of Fines per Industry



The three graphs below reflect the impact on the event date of the various aforementioned events. Divided into three sub-event graphs, namely Graph 3 (The Initiation Date), Graph 4 (The Conviction Date) and Graph 5 (The Payment Date), these graphs illustrate the CAR of the particular industry a working month prior to and post the event. The graphs combine all of the various industries into a combined sample CAR to establish the general trend pertaining to the event, and whether a clear impact can be determined. The results will be discussed in greater detail as part of Chapter 6 of this research document, where the combined CAR of the industries at the various event dates will form part of a Monte Carlo Simulation to determine the significance of the results. The JSE Bulletin database compiled by Muller and Ward (2014) was used to calculate the relevant CARs.

Graph 3: The Initiation Date



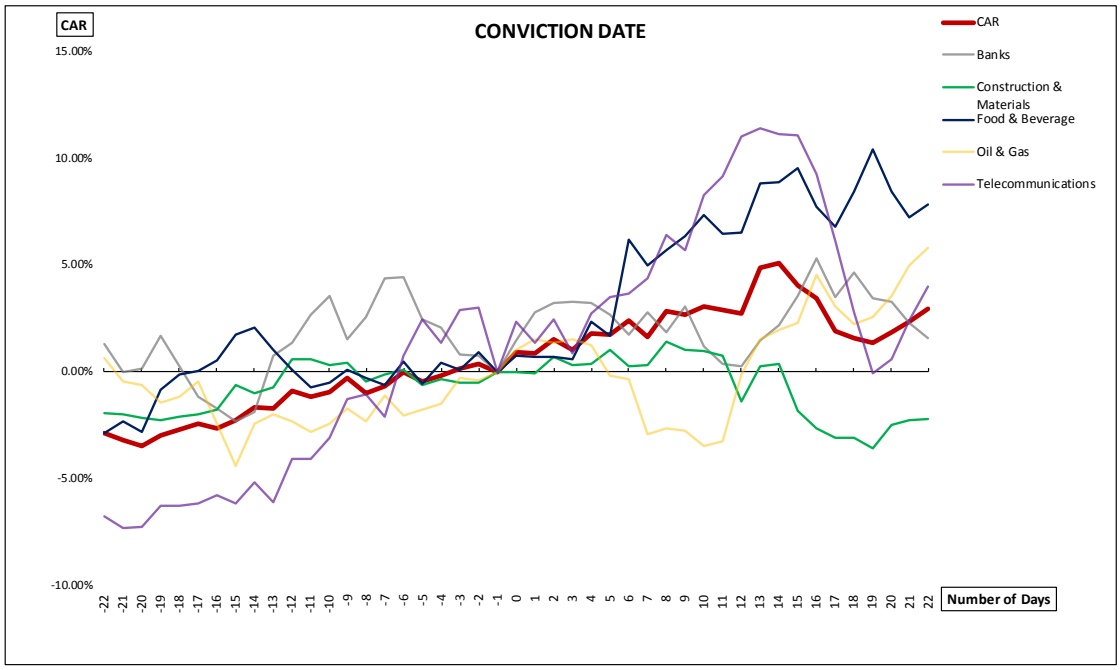
Source: JSE Bulletin Database

Based on Graph 3 it can be determined that the overall trend leans towards a neutral impact on the combined CAR of all the industries. Individually, the industries react in various ways on the event date as well as in the subsequent trading month. The only two industries to reflect positive CAR on the event date are Oil & Gas and Food &

Beverages, with the former continuing its positive trend during the subsequent trading month, and the latter reverting to a negative trend over the same period. All of the other industries reflect negative CAR on the event date, with a combined CAR for all of the industries equalling -0.91% on the date the investigation is announced.

This negative trend continues over the subsequent trading month, except in the Construction & Materials industry where the trend appears to be following the combined industry CAR. The industries impacted the most by the announcement of the investigation on the event date are Telecommunications and Banks. This reaction might be as a result of the nature of these industries, and that the market does not anticipate collusion and price-fixing to form part of these sectors, therefore reacting negatively when investigations are launched into these companies and industries.

Graph 4: The Conviction Date



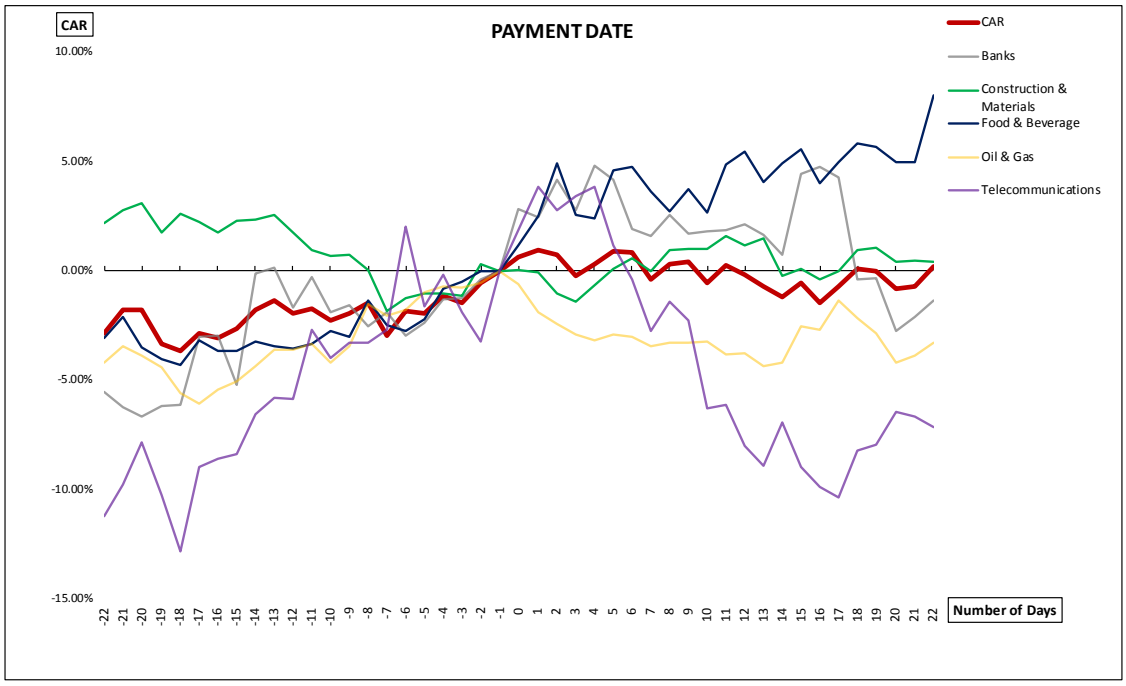
Source: JSE Bulletin Database

The combined industry CAR reflected in Graph 4 reflects a general positive trend over the trading months leading up to, as well as subsequent to, the event date. The CAR on the event date is 0.91%, which indicates an overall positive market reaction, contributing to the theory that the market might price in the risk of the potential fine at initiation stage. The overall positive trend can also be attributable to the argument that

the imposed fines are not substantial enough, and that the share prices of the various companies will reflect this.

The general trend amongst the industries is also positive, except for the Oil & Gas industry, which is fully represented by SOL in this study. Negative CAR for this industry is reflected approximately five to 12 days after the event date with an identified trough of -3.48%. This may be contributed to a slow market reaction to the event and overall magnitude of the liable fines, specifically with reference to SOL which was fined in excess of R4.5 billion. During the latter part of the subsequent trading month the Construction & Materials industry follows the same trend of Oil& Gas, but the impact of the event date cannot be attributed to be the sole catalyst for this trough due to the fact that the negative impact occurs approximately three weeks after the event date.

Graph 5: Payment Date



Source: JSE Bulletin Database

Similar to the data illustrated in the Initiation Date graph (Graph 3), the general trend of the combined CAR is neutral during the trading months surrounding the event. It can however, be determined that there is a slight positive market trend during the trading month leading up to the event date, but the overall trend remains flat. On the event date, all of the industries reflect positive CAR with the only exception being the Oil &

Gas industry which boasts CAR of -0.54% on the day of the event and reaching a trough on day 13 post the event of CAR -4.36%. The Telecommunications industry follows suit, and reflects a CAR of greater than -10% on day 17 post the event date. The impact of the event on these negative cumulative abnormal returns can be questioned due to the fact that the impact follows the event date by approximately three weeks.

It can also be argued that these delayed reactions and troughs could be a result of delayed market reaction, as the news of the final value spreads through the shareholders; or that there might be a slight difference between the actual event date and the corresponding date published in the media. Reflecting on the overall results, it is clearly visible that the only clear impact recorded, as an average on the event date, occurs on the conviction date and during the identified period surrounding this date. The other CAR reflected on the Initiation and Payment dates have a neutral trend amongst the identified industries.

There are, however, no real significant peaks or troughs on the identified event dates, and therefore an inference can be made that the market does not necessarily react in a positive or negative way on the imposing of regulatory fines. The pre-event and post-event trends, however, illustrate that the market might anticipate the investigation, conviction and payment of the regulatory fines. It therefore can be inferred that the market prices in the risk of investing in these industries when considering becoming shareholders in these companies. The Monte Carlo Simulation in Chapter 6 will assist in determining the event significance.

5.4 Investment Portfolio Analysis

As stated earlier in the document, an analysis will be conducted to establish the growth between two investment portfolios over a period of time. One portfolio will consist of companies which have been subject to regulatory fines, with the second portfolio consisting of companies which have never been subject to such fines. The style analysis was applied to this portion of the research.

In addition to the specified requirements stated in Chapter 4, a further requirement was introduced for the analysis and performance comparison. The requirement states that the comparison between convicted companies and companies which have never been subjected to a regulatory fine will be done over a period of 24 years, commencing during the first quarter of 1990. Therefore the companies included in both the initial

portfolios would have to have been listed on the JSE at that time. Table 2, inserted below, details the year in which the convicted companies in the current research were listed on the JSE. The year in which a company was listed on the JSE was sourced from the Share Data website ("Sharedata online," 2014).

Table 2: Year of JSE Listing – Convicted Companies

Company Name	Year of JSE Listing
Aveng Limited	1999
Basil Read Holdings Limited	1987
Esor Limited	2006
Murray & Roberts Holdings Limited	1948
Pioneer Food Group Limited	2008
Raubex Group Limited	2007
RMB Holdings Limited	1992
Sasol Limited	1979
Stefanutti Stocks Holdings Limited	2007
Telkom SA SOC Limited	2003
Tiger Brands Limited	1944
Wilson Bayly Holmes-Ovcon Limited	1988

Source: www.sharedata.co.za

The subsequent portfolio will focus on companies listed after 1990, but prior to 2000, with a final portfolio focusing on companies listed post 2000. The most recent listing date of the company will be used as the commencement date for the portfolios. This will allow for analysis through the comparison of companies listed within similar timeframes.

Portfolio A – Convicted Companies

The initial portfolio of convicted companies (Portfolio A1: Q1 1990 to Q2 2014) includes:

- BSR (Construction & Materials)
- MUR (Construction & Materials)
- SOL (Oil & Gas)
- TBS (Food & Beverage)

The second portfolio of convicted companies (Portfolio A2: Q3 1999 to Q2 2014) includes:

- AEG (Construction & Materials)
- RMH (Banks)
- WBO (Construction & Materials)

The final portfolio of convicted companies (Portfolio A3: Q1 2009 to Q2 2014) includes:

- ESR (Construction & Materials)
- PFG (Food & Beverage)
- RBX (Construction & Materials)
- SSK (Construction & Materials)
- TKG (Telecommunications)

Table 3 illustrates the companies which have been included in Portfolio B - the companies never convicted of a regulatory transgression and fined. The said Table 3 illustrates the company name, the date listed, as well as the share code, for ease of reference.

Table 3: Portfolio B – Company Name, Share Code and JSE Listing

Company Name & Share Code	Year of JSE Listing
AECI Limited (AFE)	1966
Afrimat Limited (AFT)	2006
Calgro M3 Holdings Limited (CGR)	2007
Dawn Limited (DAW)	1987
Group 5 Limited (GRF)	1974
Illovo Sugar Limited (ILV)	1992
Masonite (Africa) Limited (MAS)	1952
Mazor Group Limited (MZR)	2007
MTN Group Limited (MTN)	1995
Nedbank Limited (NED)	1969
PPC Limited (PPC)	1910
SABMiller PLC (SAB)	1897

Source: www.sharedata.co.za

Portfolio B – Companies never convicted

The initial portfolio of companies not prosecuted, convicted or fined (Portfolio B1: Q1 1990 to Q2 2014) is:

- AFE (Chemicals)
- GRF (Construction & Materials)
- PPC (Construction & Materials)
- SAB (Food & Beverage)

The second portfolio of companies not prosecuted, convicted or fined (Portfolio B2: Q3 1999 to Q2 2014) is:

- DAW (Construction & Materials)
- MAS (Construction & Materials)
- NED (Banks)

The final portfolio of companies not prosecuted, convicted or fined (Portfolio B3: Q1 2009 to Q2 2014) is:

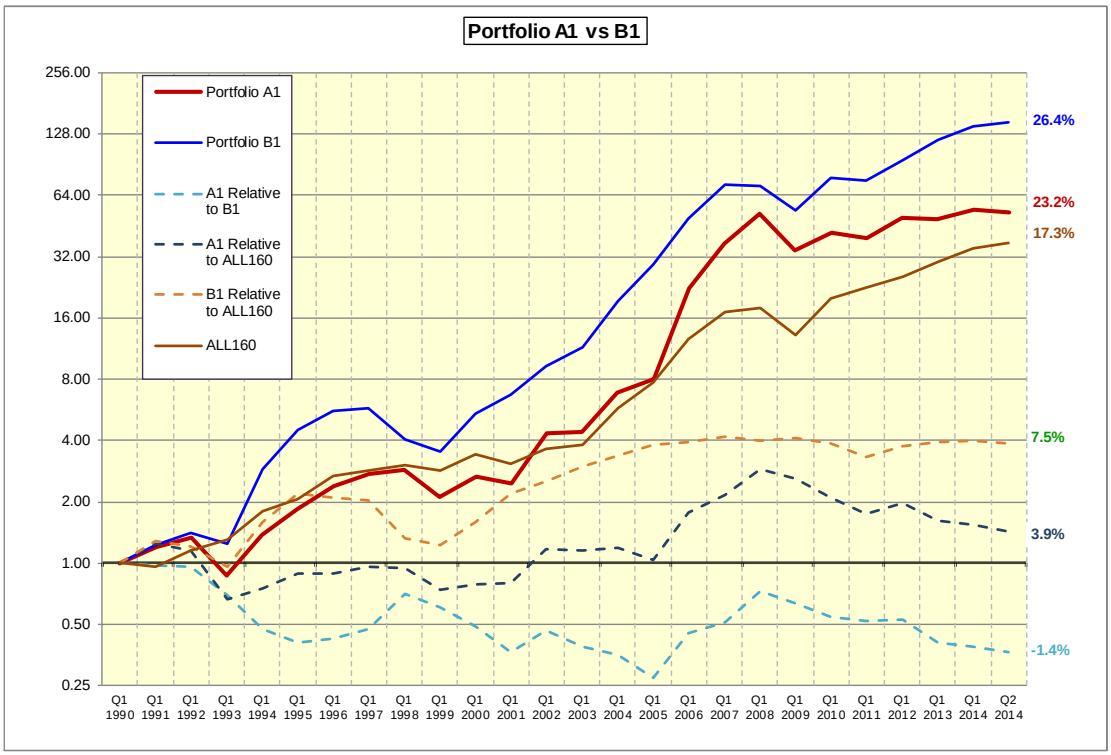
- AFT (Construction & Materials)
- CGR (Construction & Materials)
- ILV (Food & Beverage)
- MZR (Construction & Materials)
- MTN (Telecommunications)

The graphs below (Graphs 6 to 9) illustrate the performance of the various portfolios against each other. This will enable the determination of performance over an extended period of time for the identified companies, in relation to the determined dates of commencement. It must be noted that the portfolios consisting of convicted companies were determined by the sample used in the research, but the portfolios consisting of companies never fined were based on the listing date as well as random sampling by the researcher. Therefore the results may vary when different companies are included in the portfolios of companies never fined.

Other comparisons included in the various graphs are the performance of the portfolios to the top 160 shares (ALL160) on the JSE; this can also be referred to as the weighted ALSI and will provide the reader with a true sense of portfolio performance.

Finally, Portfolio A1 to A3 as well as Portfolio B1 to B3 have been combined to form Portfolio A and B respectively. The portfolios consist of one share of each of the identified companies and analysed over the period from 1990 to 2014 for the first investments, from 1999 to 2014 for the second stage of investments and from 2009 to 2014 for the final stage of investment. The share price data was extracted from McGregor BFA (2014) and was reflected on a quarterly basis, commencing at the end of quarter one of 1990 and concluding at the end of quarter two of 2014. The share prices over the determined period were sourced from the McGregor BFA research domain (“Price data company information,” 2014).

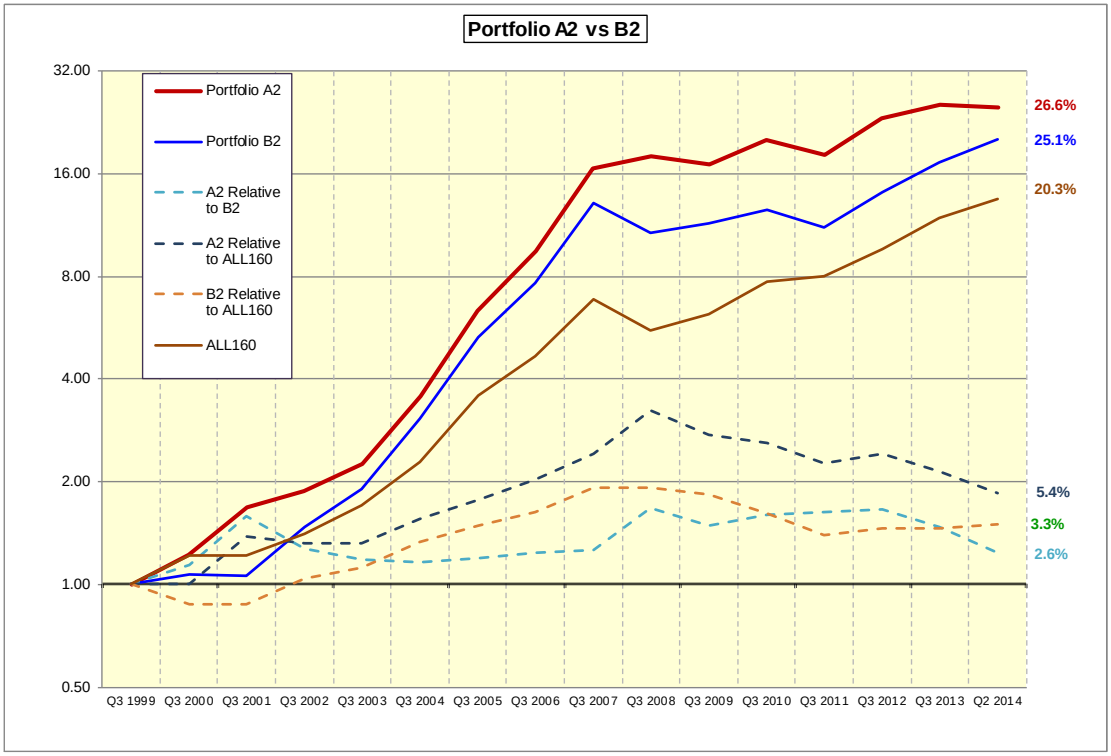
Graph 6: Portfolio A1 versus Portfolio B1



Source: McGregor BFA (2014)
Index Analysis: Chris Muller & Mike Ward (2014)

Graph 6 illustrates the comparison between Portfolio A1 and the ALL160 and stretches over a period of 291 months, commencing during March 1990, with the benchmark Portfolio B1's performance also included. The out-performance of Portfolio B1 over Portfolio A1 is clearly visible in the graph, but a detailed discussion of the results will follow in Chapter 6 of the current research. The outperformance of both portfolios relative to the ALL160 can also be identified.

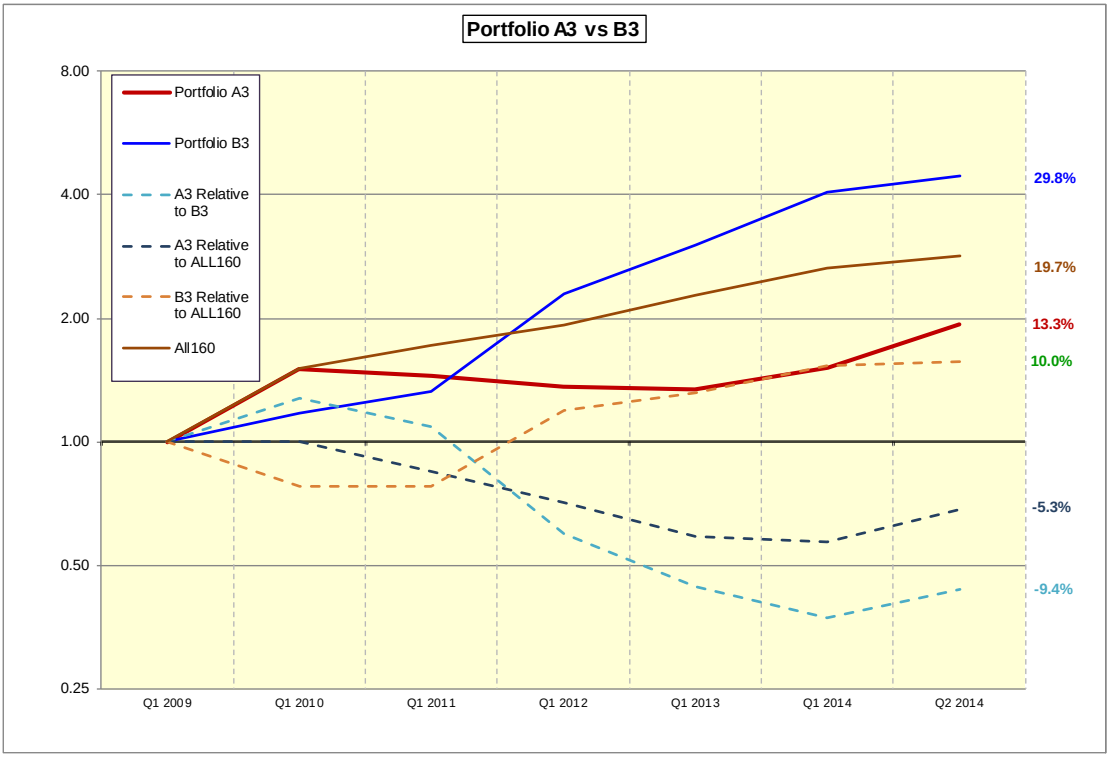
Graph 7: Portfolio A2 versus Portfolio B2



Source: McGregor BFA (2014)
Index Analysis: Chris Muller & Mike Ward (2014)

Graph 7 illustrates the performance of Portfolios A2 and B2 relative to one another, as well as the various other indices included in the previous graph. The analysis stretches over a period of 154 months, commencing during the third quarter of 1999 and concluding at the end of June 2014. In this instance the portfolio consisting of convicted companies outperformed the portfolio of companies never fined, over the determined timeframe, which is in contrast to Graph 6.

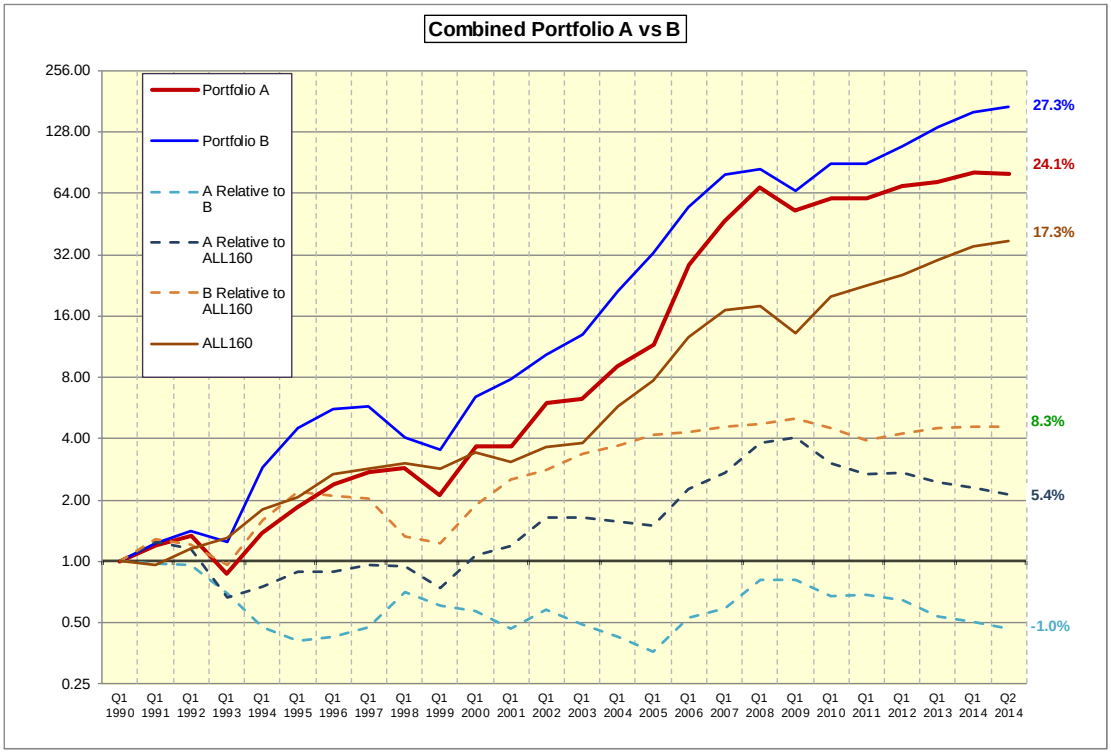
Graph 8: Portfolio A3 versus Portfolio B3



Source: McGregor BFA (2014)
Index Analysis: Chris Muller & Mike Ward (2014)

Graph 8 covers a period of approximately five years or 63 months, commencing during the first quarter of 2009. All of the relevant index information is displayed for the period under review as well as the performance comparison between Portfolios A3, the ALL160 and Portfolio B3 as the benchmark. In this instance, Portfolio B3 outperforms A3 by a substantial margin, with the latter failing to reach the performance of the ALL160 over the same period.

Graph 9: Combined Portfolio A versus Combined Portfolio B



Source: McGregor BFA (2014)
Index Analysis: Chris Muller & Mike Ward (2014)

Graph 9, as illustrated above, reflects the performance of Portfolio A (all of the companies included in the current research and fined by a regulatory body) and Portfolio B (companies never fined) relative to each other as well as the ALL160. The time frame is similar to the A1 vs B1 analysis illustrated in Graph 6, and stretches over more than 24 years.

As discussed earlier in the research, the portfolios subsequent to A1 and B1 were added to the main portfolio on the dates reflected in the individual analyses, thereby allowing for the construction of two investment portfolios where additional stock is added through the time-line. The above graph reveals that Portfolio B outperformed Portfolio A over the determined timeframe, but the outperformance of the ALL160 is evident in both the portfolios. A detailed discussion will follow in Chapter 6.

Chapter 6 – Discussion of Results

6.1 Introduction

The results of the current research will be discussed in detail with reference to the research question and sub-questions listed in Chapter 3. The results were obtained through the analysis of data sourced by the researcher to address and answer the stated questions. The methodology applied to determine the results, was an event study, which was aimed at addressing the impact of regulatory fines at specific dates; and the style engine (combined portfolio analysis), which was implemented as a longitudinal study on the two portfolios to determine the long-term effect of regulatory fines on market sentiment towards specific companies. There were a total of 12 companies identified by the researcher, all of which met the criteria set to qualify as part of the study, and also covered five different industries.

6.2 Main Research Question: Do regulatory fines have an impact on shareholder returns?

The main research question was approached via two perspectives. The first being the impact of the regulatory fine on a specific event date, and the second determining the impact of regulatory fines as part of a longitudinal study (combined portfolio analysis). The results of the latter will be more broadly explained under point 6.5 of this chapter.

The event study methodology implemented by the researcher aimed to establish if any impact on the CAR of a particular company and industry can be identified at the various stages of the fine process. The stages were identified as the initiation date, the conviction date and the payment date. The results displayed in Chapter 5 revealed the performance of each industry, as well as a combined CAR for the sample at the various event dates.

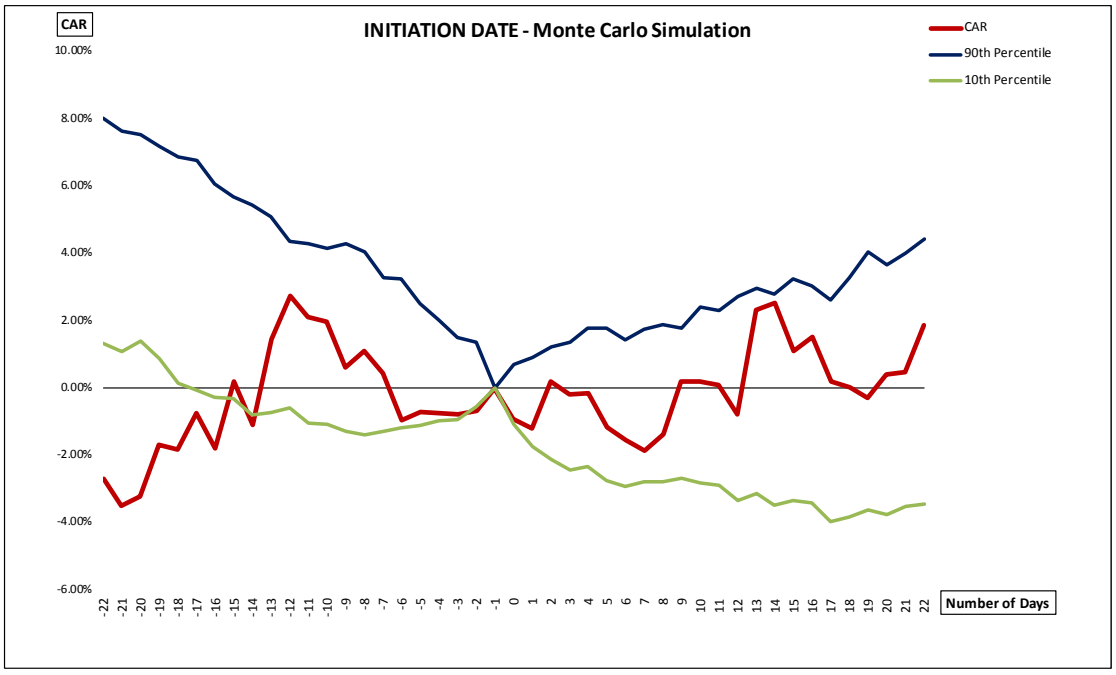
To determine if the combined CAR was of any significance, the researcher applied a Monte Carlo Simulation to each of the event stages and the combined CAR. The analysis included the calculation of 100 individual data points for each event stage based on the combined CAR. The top 10% (90^{th} percentile) and lowest 10% (10^{th} percentile) of the data series were plotted on the same graphs (Graphs 10 to 12), as the combined CAR to establish if there are any points on the combined CAR which exceed the 90^{th} or 10^{th} percentile. These points can then be viewed as significant in relation to the current research.

Initiation Date

The combined impact on the CAR of the identified industries was - 0.91%, reflecting a slight negative impact on the date of the investigation announcement. Approximately 60% of the industries revealed negative CAR on the event date, with these industries continuing on a negative trend in the month following the announcement. It must, however, be noted that a small recovery is visible approximately two to five days after the event date. This recovery is also noticeable in the industries not reflecting negative CAR, but in the instance of these industries it can be inferred as a greater positive CAR along the identified trend. As stated earlier, a neutral combined CAR is visible along the determined time-line, inferring that there was no real significant impact on shareholder returns at the initiation date.

Graph 10 reveals the results of the Monte Carlo Simulation (MCS) at the initiation date of the regulatory fine process. Approximately 14 trading days prior to the event it can be noticed that the combined CAR enters into the band of the 90th and 10th percentile from a negative position. The combined CAR remained within this band through the event date as well as the subsequent trading month, henceforth revealing no significant impact on shareholder returns during this stage.

Graph 10: Initiation Date – Monte Carlo Simulation



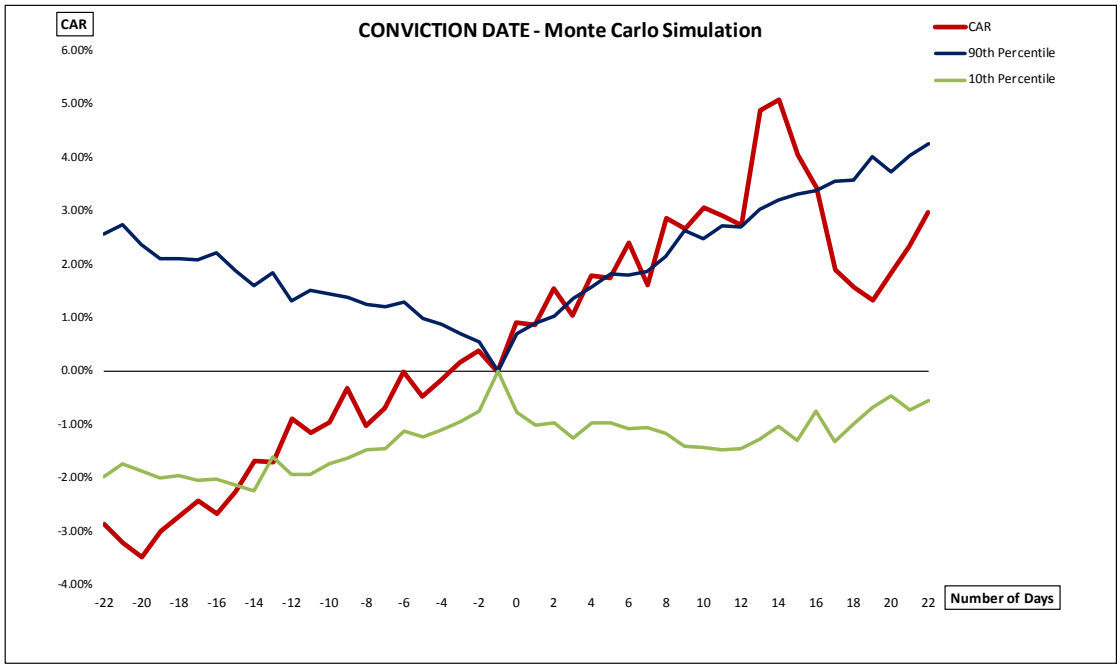
Source: JSE Bulletin Database

Conviction Date

The industry combined CAR at this stage of the fine process reflected a positive trend commencing at the beginning of the trading month prior to the event, and continuing this trend in the trading month subsequent to the event. As stated previously, a positive combined CAR of 0.91% was calculated on the event date, with no identified industry reflecting a negative CAR on the said date.

It can be inferred that the market reaction can be attributable to the possibility that the risk of conviction is priced into the share price after the initiation date, which can result in the positive CAR, as well as the theory that the fines imposed are too low, and that the share price reflects this during the determined timeframe. The MCS, as plotted in Graph 10, reveals that the positive trend experienced by the combined CAR can be referred to as significant, as it exceeds the 90th percentile of the various data series included in the analysis during the trading month subsequent to the event date.

Graph 11: Conviction Date – Monte Carlo Simulation



Source: JSE Bulletin Database

This finding may add to the argument that the imposed fines are too low, and that shareholders consider the industry and probability of conviction when investing in the companies included in the sample. The positive trend, however, continues through the

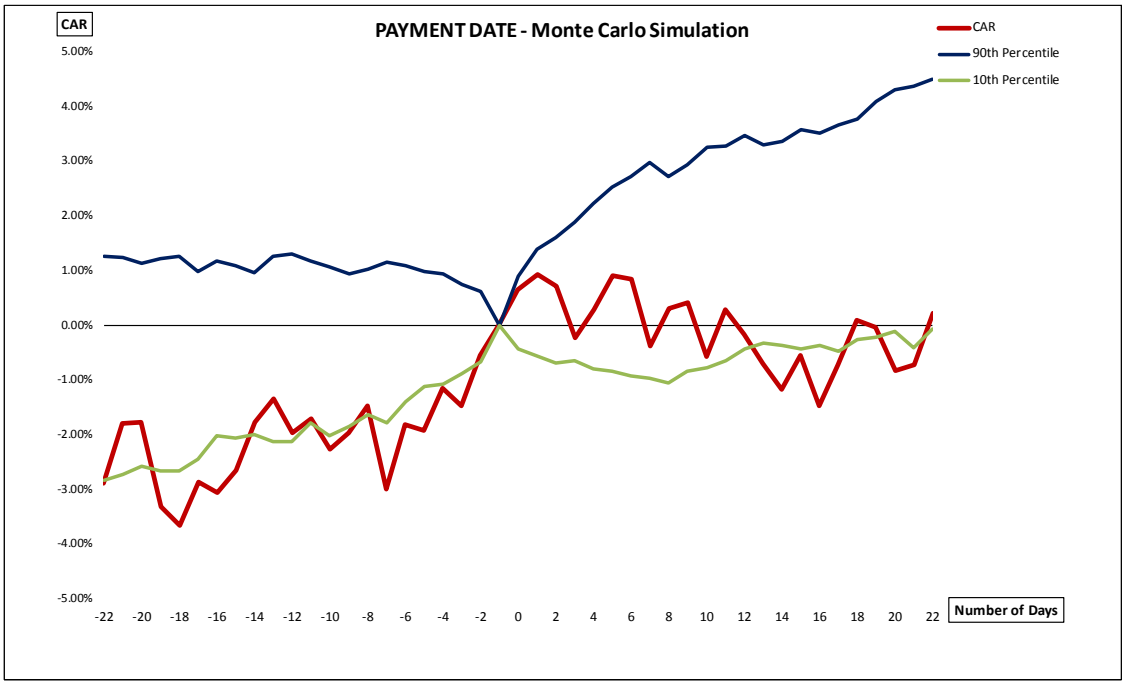
subsequent trading month, but declines back into the band between the 90th and 10th percentile approximately 16 trading days after the event. This reflects that the combined CAR for these days is significant in relation to the event, and the positive trend can be judged to be as a result of the afore-mentioned assumptions.

Payment Date

The combined CAR on the event date at this stage of the fine process is 0.65%. This reflects a slightly positive reaction in the market on the event date; but the overall trend during the subsequent trading month remains flat. It is interesting to note that a positive market reaction can be identified leading up to the event. The MCS in Graph 12 reveals that the negative CAR reflected by the market during the week leading up to the event date falls outside of the 90th percentile and 10th percentile band, indicating that the market reacted in a significant manner leading up to the event.

This reaction might infer that the payment date in the minds of the investors is the date of reality, and that the “cash out” effect is much more realistic than the previous stages of the process. The decline of the positive trend during the trading month following the event may be attributed to the impact of the Oil & Gas industry on the combined CAR. The sizes of the fines incurred by SOL are substantially the largest, and may be the catalyst for the decline in CAR. The delay in impact can be attributed to the fact that the payment date of the EU was not identified as a specific date, but revealed as January 2009. The lack of a specific day might influence the results to be delayed.

Graph 12: Payment Date – Monte Carlo Simulation



Source: JSE Bulletin Database

Conclusion

Based on the evidence reflected in the event studies per the pre-determined event dates, as detailed above, it can be argued that regulatory fines affect shareholder returns neutrally in the majority of the industries at the initiation date. It can be argued that a positive effect can be witnessed at the conviction stage, with a negative to neutral effect at the payment stage of the process. The longitudinal effect will be discussed as part of point 6.5 below.

6.3 Sub-Question: Industry reaction to regulatory fines

To establish if a distinct difference in industry reaction to regulatory fines can be identified, reference is made to Graphs 1 to 5. The reactions of the various industries at the different stages of the fine process can be described as follows:

Banks

The Banking industry is represented by only one company in the current research, namely RMH. Only one event was identified for the said company with an associated fine of R2.1 million. Together with the Telecommunications industry, Banks reflected the greatest negative impact on CAR at the initiation stage. A negative CAR of -5.51% was identified on the event date, with a continuous negative trend over the following month.

The market reaction at the conviction and payment stages of the fine process was, however, positive, reflecting CAR of 1.45% and 2.83% respectively on the event dates. The inference can therefore be made that the market clearly reacted negatively when the investigation was initiated, but this negative reaction allowed for the incorporation of the risk into the share price, and henceforth allowed for positive returns at the subsequent event dates. The initial negative reaction may be contributed to the critical view the market has on the Banking industry, and that transgressions will be reflected in the share price.

Construction & Materials

More than 50% of the sample of convicted companies formed part of the Construction & Materials Industry. This can be attributed mainly to the fines imposed on the commission as a result of the SWC 2010 collusion. Four out of the seven companies included in the sample for the said industry were first-time offenders as a result of the SWC 2010, and therefore the impact of this event is clearly visible in the results. The companies included in the Construction & Materials industry and which formed part of the current research were AEG, BSR, ESR, MUR, RBX, SSK and WBO. The total events identified amongst these companies were 12, which are approximately 50% of the total number of events identified in the research.

Similar to the Banking industry, the Construction & Materials Industry reflected a negative CAR on the initiation date. The negative CAR of -1.24% was identified on the event date, but it was followed by a quick recovery. The impact on the CARs at the conviction date and payment date were negligible and reflected no real impact on shareholder return. The total fines incurred by the said industry over the identified period amounted to R1.652 billion or an average of R137 million per event.

The lack of reaction by the market to the conviction and payment dates may indicate that investors in the said industry are more risk tolerant, and therefore expect some penalties to be incurred over a certain period. The potential of greater future profits (Combe & Monnier, 2011), might also influence the investment decision, expectation and reaction in the industry. Therefore the conclusion can again be made that the initial negative impact at the initiation stage absorbs the risk in the market and prices this into the remainder of the process, explaining the neutral market reaction at the subsequent stages.

Food & Beverage

The companies identified in the research and which form part of the Food & Beverage industry were PFG and TBS. Each of these companies incurred two fines, with a total fine value of R847 million or R211.75 million average per event. The impact on CAR at the initiation stage of the process was nominally positive on the event date, with a CAR of 0.77%. It must, however, be noted that after the event date, the CARs of the industry became negative, and continued this trend for the month following the event date. This can infer that there was a delayed market reaction to the investigation, or that subsequent events influenced the CARs to become negative.

The conviction and payment date reflected positive CARs similar to the initiation date, but in both these instances the positive trend continued for the months after the event dates. The impact on the said industry can therefore be interpreted as positive or neutral, with the only negative trend appearing subsequent to the initiation date. The inference can therefore again be made that the market has priced in the risk of the potential fines at the initiation date, and therefore the subsequent events revealed no significant impact.

Oil & Gas

The Oil & Gas industry is represented only by SOL in the current research, but includes four events with a combined value of R4.596 billion. This is the industry with the greatest fine value of all the industries under review. The average fine incurred by SOL per event is R1.149 billion.

In contrast to the findings of the afore-mentioned industries, the Oil & Gas industry's CARs for the initiation and conviction dates were positive, with CARs of 1.71% and 1.02% respectively. There are however negative CARs identifiable approximately five days after the conviction date, which might refer to a delayed market reaction or alternate events; but considering the quantum of the fines, the former might be more realistic. As with the Construction & Materials industry, investors in SOL might have a greater risk appetite than those of other industries, and therefore the fines imposed may not have negative returns as a consequence at these stages.

The only negative CAR is visible on the payment date at -0.58%, which can also be argued not to be of great significance. There is, however, a negative trend following this date, which can infer that the market reacted to the fine value over the weeks following the event date.

Telecommunications

Similar to the Banking and Oil & Gas industries, the Telecommunications industry is only represented by one company, TKG. Two events were identified and the fines equalled approximately R649 million. The market reacted negatively at the initiation stage with a negative CAR of -2.40%, which continues on a negative trend and peaks at -12.22% six days after the event date.

Strong CARs are noticeable on the subsequent conviction and payment dates being 2.34% and 1.84% respectively. These positive CARs indicate that the market did not react negatively to these events, and again refers to the possibility that the risk of the potential fine is priced into the share price by the market at initiation stage.

Conclusion

To reflect on the question and the potential conclusion to the findings, a clear trend can be identified that the majority of the industries appear to react negatively during the commencement of the process, but reflect positive CARs at the intermediate (conviction) and completion (payment) stages. This clearly indicates that the market absorbs the risk when the investigation is announced and in a sense expects the identified companies to be convicted, therefore pricing in the risk early in the process and thereafter acting positive to neutral.

It must, however, be noted that the Banking, Oil & Gas and Telecommunications industries are only represented by one company each. The results therefore reflect only the market reaction towards that specific company, which may be influenced by investor sentiment and loyalty to a specific company.

6.4 Sub-Question: Is the quantum of the fine large enough to deter future anti-competitive behaviour?

The results reflected that of the sample of 12 companies; five have been convicted of a regulatory transgression only once. These companies are BSR, ESR, MUR, RBX and RMH. The sample also revealed another five companies convicted of regulatory transgressions twice. These companies are PFG, SSK, TKG, TBS and WBO. The remaining two companies have been convicted four times each. These companies are AEG and SOL.

Due to the fact that no evidence exists that companies fined only once and included in the current research will be deterred from any future transgressions, these companies will not be included in the attempt to answer the research sub-question. These companies comprise approximately 42% of the sample.

The average fine value of the companies fined more than once is R337.88 million, but this figure is greatly influenced by the magnitude of the fines imposed on SOL. If SOL is excluded from the calculation, the average fine imposed on the remaining companies per event is R202 million. The average percentage of company or subsidiary turnover implemented as a fine for the companies under review ranges between 3% and 10%.

The conclusion can therefore be drawn that collusive behaviour is not necessarily deterred by the current size of the imposed fines, and that companies may weigh the

potential rewards versus the potential liability when considering acting in a collusive manner. Therefore, based on the fine average of approximately 6% of turnover, in the opinion of the researcher, a company may decide to collude if the returns exceed this liability.

6.5 Sub-Question: Is the performance of fined companies better in the long-run than that of companies which have not been fined for a regulatory transgression?

To further the discussion with regards to the main research question, the above-mentioned sub-question contributes to the attempt to answer the main research question. In an attempt to answer the sub-question under discussion, the researcher conducted three individual portfolio analyses as well as an over-arching portfolio comparison between the "fined" and "never fined" companies. The results of each portfolio analysis can be explained as follows:

Portfolio A1 versus Portfolio B1

The time-frame for the longitudinal study covered a period of more than 24 years, from 1990 to 2014. Portfolio A1 consisted of 50% Construction & Materials, 25% Oil & Gas, and 25% Food & Beverage. Portfolio B1 reflected A1 exactly, apart from the 25% Oil & Gas weighting, which was replaced by Chemicals with a similar weighting. The listing date of the relevant companies, determined the portfolio composition as well as commencement.

Graph 6 reflected the out performance of Portfolio A1 by Portfolio B1 by an average of 1.4% per annum over the period, with Portfolio A1 growing at an average of 23.2% per annum and Portfolio B1 at 26.4%. Both the portfolios outperformed the ALL160, which grew at an average annual rate of 17.3%. In closer analysis of the graph, the growth of the ALL160 and Portfolio A1 are similar through the 1990s as well as the first few years of the 2000s. During 2005 a clear outperformance between A1 and All160 is visible with a peak in 2009 after which the outperformance is slowing. This slowing of the outperformance can be based on the 2008/09 global financial crisis, but it can also refer to the fact that the majority of the commission's investigations into the companies included in the portfolio were initiated during the mid-2000s, with convictions and payments following a few years later.

The inference can therefore be made that if an investor invested in the portfolio which included companies later convicted and fined for regulatory transgressions, the portfolio would outperform the ALL160 by an average of 3.9% per annum. The investors in Portfolio B1 would however experience an outperformance of 7.5% on the ALL160 per annum. Therefore, based on the composition of these portfolios as well as the chosen time-frame, investment in companies which were never fined would have produced greater results on growth, than investment in the convicted company portfolio. Therefore it appears as though the regulatory process has had an effect on the rate at which Portfolio A1 outperformed the ALL160.

Portfolio A2 versus Portfolio B2

Portfolio A2 and B2 consisted of two-thirds Construction & Materials and one-third Banks. The study covered approximately 14 years, commencing in September 1999 and concluding at the end of June 2014. Contrary to the analysis of the first portfolios, in this instance the portfolio consisting of convicted companies (A2) out-performed the companies never fined (B2) by an average growth of 2.6% per annum over the period under review.

Both the identified portfolios also out-performed the ALL16 over the 14-year period, with the index growing at an average of 20.3% over the same period. In this instance investors in the convicted portfolio (A2) would have achieved greater growth than those which invested in Portfolio B2.

In relation to the ALL160, the convicted portfolio continuously outperformed the index from the commencement of the portfolio (Q3 1999). This outperformance peaked during 2008, after which the rate slowed in the subsequent years. The outperformance can be linked to performance of the Construction & Materials industry which constitutes the majority of A2. The slowing in outperformance can be linked to the initiation of the commission's investigations into the collusion surrounding the SWC 2010 as well as the global financial crisis.

Portfolio A3 versus B3

In the instance of these portfolios, the weighting was 60% Constructions & Materials, 20% Food & Beverage and 20% Telecommunications. The study commenced in the

first quarter of 2009 and concluded in the second quarter of 2014, covering approximately five years.

The results revealed that the convicted portfolio (A3) was not only out-performed by Portfolio B3, but also by the ALL160 over the determined period. Portfolio A3, which managed to grow at an average annual rate of 13.3% over the determined period, grew at negative rates relative to B3 (-9.4%) and the ALL160 (-5.3%). Portfolio B3, however, experienced the greatest average growth per annum of all of the tested portfolios in the current research with 29.8% over the period. In the instance of the convicted portfolio, the performance was similar to that of the ALL160 for the first year, but subsequent Q1 2010, the ALL160 continuously outperformed A3, with a peak occurring during Q1 2014.

Currently, it appears as if the performance of A3 is strengthening towards the ALL160. The inference can be made that the below-par performance of A3 can be attributed towards the fact that the commencement of the portfolio coincided with the initiation of the SWC 2010 collusion investigations by the commission. The portfolio is weighted towards the Construction & Materials industry, and therefore the influence of the industry on the portfolio performance will be substantial.

Combined Portfolio A versus Combined Portfolio B

The overall findings reflected the total of the afore-mentioned portfolio analyses. The time-line, similar to the A1 vs B1 analysis, stretched over 291 months commencing in 1990 and concluding in 2014. The combined Portfolio A (24.1%) performed at an average of -1.0% to the combined Portfolio B, but outperformed the ALL160 by 5.4%. Portfolio B performed at an average growth rate of 27.3% over the period under review. The weighting of the various portfolios relative to the sample is as follows (the number of companies is in brackets):

Portfolio A and B

- Banks - 8.33% (1)
- Construction & Materials - 58.33% (7)
- Food & Beverage - 16.67% (2)
- Oil & Gas - 8.33% (1) Portfolio A only
- Chemicals - 8.33% (1) Portfolio B only
- Telecommunications - 8.33% (1)

With reference to the main research question (point 6.2) as well as the current sub-question, the inference can be made that the initiation of investigations into collusive and anti-competitive behaviour has some impact on the performance of the convicted portfolio (A). This statement can be substantiated by the slowing in outperformance of Portfolio A relative to the ALL160 during the period 2008/09, which coincides with the initiation of investigations by the commission into the collusion surrounding the SWC 2010. The preceding event studies, however, concluded that a neutral impact can be determined during the initiation and payment stages of the process, with a nominally positive impact on CAR during the conviction stage of the process.

The effect of regulatory fines can therefore be inferred to having a dampened effect on the growth of portfolios consisting only of those companies, versus the portfolio combined by the researcher, of companies not guilty of regulatory transgressions (B). Although it must be noted that both portfolios A and B significantly out-performed the ALL160, which carries the inference that investment in either of these portfolios would have “beaten” the market.

Note must, however, be taken of the fact that the portfolios are heavily weighted towards the Construction & Materials industry, and that the performance of the portfolios as well as the impact of regulatory fines are more linked to the performance of said industry than the other industries included in the research. It can also be inferred that by the evidence of the continuous outperformance of Portfolio A to the ALL160, that the commission generally focused its investigations in the past on companies and sectors which performed above the norm.

The question can therefore be raised whether these industries are successful due to the effect of collusive and anti-competitive behaviour by the companies within the sectors, or if the success of these industries attracts collusion. This might be useful for further research into this area.

Chapter 7 – Conclusion

7.1 General Overview

The aim of the research was to establish if regulatory fines have an identifiable and substantial impact on shareholder returns. The investigated fines originated as a result of collusive or cartel-like behaviour, and imposed by regulatory bodies, with specific aim at South African companies listed on the JSE. Various other criteria were also included in the determination of the sample. The market reaction at various stages of the fine process were also tested and analysed to establish if any variances in the shareholders reaction could be identified at these stages. The market reaction at these various stages formed part of the first set of research objectives stipulated. The initiation, conviction and payment dates were identified as the most important stages of the regulatory fine process.

The industries identified during the study included Construction & Materials, Oil & Gas, Telecommunications, Banks and Food & Beverages. Examples of industries and companies fined by regulatory bodies, not included in the sample, were identified to assist the reader in forming a holistic view of collusive behaviour on a local and international basis. Some of the main international companies identified as part of the study were Sasol, GlaxoSmithKline, Walmart and Microsoft, amongst others. The conclusion was reached at this stage of the research, that collusion is not industry or country bound, but can be found worldwide and in any industry; it must however be mentioned that industries such as Construction & Materials lends itself more to collusive behaviour, due to the similarity amongst the products in the industry which is viewed as a driver of collusive behaviour (Martinez-Sanchez, 2011).

The research problem identified stemmed from the fact that construction stocks of companies fined due to collusive behaviour related to the SWC 2010 made strong gains after the conviction (Hedley, 2014). The possibility that the market prices in the risk associated with regulatory fines was investigated. Other potential liabilities in certain industries were also identified and investigated. The size of the fine and the intended impact were included in the analysis to determine if the deterring effect was achieved. The second set of objectives identified, addressed the statistical data, and focussed on the size of the fines, the number of times any specific industry and company was fined, as well as the process duration. The average fine imposed by the EU over the past few years equalled €116 million (Combe & Monnier, 2011), with the average commission fine in South Africa being R336.74 million.

The third objective of the research was to establish if regulatory fines have a longitudinal effect on the returns of the sample companies. This was done through the formation of a portfolio of convicted companies, which was compared to the equal weighted all share index (ALL160) and a portfolio of companies which were never fined.

7.2 Academic Review

The academic review was divided into two sections, where one area focused on the theory base of the research topic and area. The other section of the academic review focused on current and past literature by academics and scholars in the field. The theory base was aimed at providing reasons why collusion exists, what the positive and negative impacts are for the participants as well as society, and finally if collusive behaviour can be predicted. The literature review on the other hand was aimed more at regulation, regulatory fines and the impact of regulation and fines on shareholder returns.

Commencing with the theory base, some of the reasons why collusive behaviour occurs are:

- Where there is evidence of unusually large demands and associated returns in a specific industry (Rojas, 2012).
- In instances where the future venture forecasts increased illegal profits and gains (Combe & Monnier, 2011).
- In industries where lower copying costs exist between products, also viewed as increased similarity amongst products (Martinez-Sanchez, 2011).
- The motivation of CEOs to achieve greater personal gain through incentive bonuses (Chen, 2010).

Based on the findings through the reviewed theory base the conclusion can be reached that the main driver for collusive behaviour is financial in nature. It is generally aimed at potential future profits as well as the increased magnitude of these profits and that companies involved in collusive behaviour generally have the view that these increased financial gains can only be achieved through collusion.

The research concluded that the impact of collusion on society remains difficult to quantify, as well as whether any reputational damage is suffered by the convicted companies. The research however managed to establish some areas impacted by

collusion, with one being the cost of debt and equity, which increases as collusion increase (Baxamusa & Jalal, 2014). Opportunity cost to society may also increase in markets where collusion is present, and the view exists that the longer collusion is sustained in the market, the greater the societal impact will be.

The prediction of collusive behaviour has also proved to be difficult to achieve through proof beyond any reasonable doubt. The model by Chotibhongs and Arditi (2012) confirmed the difficulty in predicting collusion, but managed to identify participants in past collusive behaviour as well as industries where collusion is more likely to occur. Other factors of identification include common mistakes in bids, identical prices quoted by firms and the failure of bid acceptance by the lowest bidder.

The literature review unveiled that regulation and regulatory fines are fundamental components of market economics as it prevents the distortion of competition (Aguzzoni et al., 2013). The research established that due to the fact that regulatory intervention must be applied to all channels in order to be successful and that constant innovation is required to create a sustainable effective impact. The risk of overenforcement, as identified through the literature, also needs to be taken into account when rulings are made by regulatory bodies, in order to avoid driving companies out of business and thereby adversely affecting competition.

The research concluded that the market cannot be predicted to act in a particular way to regulatory fines, the evidence produced as part of the event study and Graphs 3 to 5 substantiated this view. The literature also revealed that the maximum fine that can be imposed by a regulatory body can reach up to 10% of the convicted company's turnover (Mihai, 2008). Literature by Cloninger and Waller (2000) found that AR of companies disclosing collusive behaviour as negative. The current research established that in some industries the date of investigation initiation had negative CAR as a result, which confirms the findings by Cloninger and Waller (2000), but the overall trend reverted to neutral at this stage of the process.

7.3 Methodology and Findings

The sampling technique used was non-probable quota sampling and allowed for the inclusion of companies which met the criteria for participation as set out in the study. The data incorporated was secondary and quantitative in nature, and focused on publicly available information through the JSE and other sources.

The analysis of the data was done via two methods, the first being event studies on the determined dates of the catalysts and the second method were focused on a longitudinal study, through a style analysis (engine). The style engine, referred to in the study as the portfolio analysis, was aimed at the determination on whether regulatory fines have longitudinal effects on portfolios consisting of convicted companies. The findings through the afore-mentioned methods were as follows:

7.3.1 Event Studies

The research sample covered five industries listed as listed on the JSE, 12 companies, 23 verifiable events with 69 sub-events, which refers to the initiation, conviction and payment stages of the process. The events studies included the relevant data for each of the sub-events and covered a period of one trading month pre and post the event date. The CAR of each company for each individual sub-event was compiled in a worksheet, grouped per industry. This allowed for the calculation of CAR at each stage of the regulatory fine process for each industry, as well as the calculation of a combined CAR for the sample.

The results revealed that industries in general vary in the way they react at the various stages of the process. The combined CAR, however, returned the following results at the various stages.

At the initiation stage, the combined CAR reflected a neutral result, thereby stating that although certain industries might react in a positive or negative way, the overall consensus appeared to be flat. This would provide substantiation for the inference that the market does not react in a specific way when the investigation into collusive behaviour is announced. The findings by Cloninger and Waller (2000) that the AR of certain companies dropped into negative territory when collusion is detected in a company however still holds true, as the results revealed that certain industries experienced negative returns on the event date, apart from the flat average of the sample.

To further test the findings at this stage of the process, a Monte Carlo Simulation (Graph 10) was undertaken by the researcher to test if the combined CAR fell within the 90^{th} and 10^{th} percentile of all the collected data points. Based on the results of Graph 10, it can be confirmed that the combined CAR fell within the 90^{th} and 10^{th} percentile of the data points, during the event date, as well as during the subsequent trading month, thereby confirming the neutral market reaction at the said stage.

The conviction date study revealed an overall positive combined CAR for the sample prior to the event as well as after. It can be inferred from this finding that the market was in a sense relieved with the result of the conviction and reacted accordingly. This relief might be due to the fact that the sizes of the fines where less than expected. All of the relevant industries reflected positive CAR on the event date and subsequent, except for Oil & Gas which went into negative territory approximately one trading week after the event.

This may be due to delayed market reaction, another unrelated event or the challenge in pin-pointing the exact event date. The MCA (Graph 11) revealed that the positive CAR experienced by the sample during the trading month after the event, was indeed significant as it exceeded the 90th percentile of the collected data points for approximately 16 trading days, thereby confirming that the market reacted positively to the catalyst.

The payment date reflected a general positive trend in the combined CAR prior to the event date, but a flat trend during the subsequent trading month. The individual industries reacted mainly positively during and after the catalyst, with the exception of two, which yielded negative CAR on the event date. The MCS (Graph 12) reflected that the combined CAR grew from below the 10th percentile during the trading days prior to the event, where it remained within the 90th and 10th percentile through the event date as well as up to the third trading week subsequent the catalyst, where it fell below the 10th percentile again. The market reaction can therefore be viewed as neutral during the payment stage, which can substantiate the inference that the market prices in the risk of the regulatory fine during the process and when the payment is made, the reaction will remain flat.

7.3.2 Portfolio Analysis (Style Engine)

The main objective of the portfolio analysis was to track and illustrate the growth of a portfolio (Portfolio A) consisting of companies which at one point during the determined period where fined for a regulatory transgression by a regulatory body, in particular collusion or cartel-like behaviour, against the equally weighted all share index (ALL160). As a benchmark, the researcher included another portfolio in the analysis, which consisted of companies never convicted and fined for a similar transgression (Portfolio B).

The results revealed as part of Graph 9, *Combined Portfolio A versus Combined Portfolio B*, which Portfolio A over a period of 24 years, performed on par with the ALL160 for the first 10 years of the study up to the year 2000. Subsequent to 2000 Portfolio A gradually started to outperform the ALL160, with a peak outperformance reached during 2008, after which the outperformance slowed, but still remained significantly higher than the index.

The overall growth of Portfolio A was 24.15 per annum, with the ALL160 growing at 17.3% per annum over the period, thereby inferring that regulatory bodies tend to focus on industries which are performing above market norm. The decline in outperformance can be linked to the fact that the majority of the investigation initiations commenced during this period and that although no real negative CAR growth was identified during the event studies, the fines had an impact which slowed excessive growth, as compared to the ALL160.

As a benchmark Portfolio B was plotted on the same graph and the results revealed that this portfolio also outperformed the ALL160, but also managed to outperform Portfolio A. The inference can be made that greater growth would have been experienced by investors in these companies in similar industries as Portfolio A. The pairing and composition of Portfolio B is open to subjective criticism due to the fact that the portfolio can be altered to include different companies which might yield a different result.

7.4 Research Limitations, Recommendations and Future Areas of Study

The limitations of the current research as listed in the study can be summarised as the fact that only companies listed on the JSE were considered, no qualitative input and primary data was sourced and included; the challenge existed to establish if the dates published in the media were the actual event dates and finally the sample selected only included companies which have been convicted of regulatory transgressions, but the possibility exists that companies which are currently colluding are not yet identified and convicted and henceforth the results do not include the reaction of these companies. Another limitation identified as part of the portfolio analysis, was the challenge of pairing companies in the portfolio which was never fined (Portfolio B). The results of the portfolio analysis to compare Portfolio A with Portfolio B as a benchmark will therefore vary when different parings are done.

The only recommendation to be made by the researcher to regulatory bodies is to review the maximum penalty of 10% of related turnover and to ensure that the penalty imposed on the specific company has an effect of deterrence. The findings revealed that in some instances the market appeared to be relieved by the magnitude of the fine and actually responded in a positive manner. The effect of CAR on the conviction date is evidence of this occurrence. Therefore the parameters set by regulatory bodies should be flexible and susceptible to change, to ensure that overenforcement is mitigated; but that the fine has a big enough affect to deter future collusive behaviour.

Potential areas of future research can be listed as the following:

- To attempt the research topic from a qualitative perspective and to establish through the sourcing of primary data what the impact on regulatory fines can be on the management of the company as well as how the market perceives the business after it has been convicted of a transgression.

- The study can be expanded to include international companies listed on international stock exchanges. This will provide more holistic data regarding the internal effect of regulatory fines on shareholder returns.

- Industries which are convicted and fined outperformed the market constantly over a couple of decades. This outperformance can be due to the fact that collusion is present in these industries - or is the success of these industries attracting collusive behaviour?

7.5 Final Summary

The research provided the opportunity to determine if the fines imposed by the commission or other regulatory bodies have the desired effect on the convicted companies. The results revealed that no real negative impact can be witnessed and that the market tends to price in the risk of investing in the associated industries, and therefore no real outliers are visible on negative CAR for the selected sample. The market reaction during the conviction stage confirmed that generally, the market will react in a positive manner should the fined be assumed to be reasonably low in relation to the performance of the company.

The researcher trusts that the results and relevant data, as well as the included academic review, provides sufficient substantiation for the concluded findings. It must,

however, be noted that the size of the sample can be viewed to be relatively small and that the study can be revisited in a few years when the sample size has increased to reaffirm or challenge the current findings.

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