

**COMPETITION IN THE SOUTH AFRICAN CEMENT INDUSTRY AFTER
THE CARTEL DISSOLUTION OF 1996 WITHIN THE NEW
GOVERNMENT POLICIES**

By

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Declaration

I confirm that this work reflects my opinion of the South African Cement Industry and that all work carried out by other researchers has duly been referenced.

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Abstract

This study examines the state of competition in the South African Cement Industry after the cartel dissolution of 1996. The study further looks at the impact of the mining charter, which encompasses black economic empowerment to the industry.

It argues that high investor risk exposure to the multinationals and rand-dollar exchange rate is key to high cement prices. It sees black economic empowerment as the competitive advantage and can assist in improving competition as well as alleviating exorbitant foreign investment.

While cartel has been officially dissolved, the industry continues to maintain high cement prices, which increase successively from company to company, based on this; the study raises the question of tacit collusion.

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CHAPTER 1: ORIENTATION

1.1 Introduction

This study was prompted by the new democracy achieved in 1994 in the Republic of South Africa, which allowed the black community to vote. Before the new dispensation in South Africa, the majority of South African communities (particularly black South Africans) did not have proper homes and infrastructure conducive for a better life. For example people lived in informal settlements (shacks), there was no proper sanitation and cement an important commodity for the construction of any infrastructure was an unaffordable commodity for most of these communities. Evidently, Cement plays a major role in the development of any country's infrastructure and therefore needs to be affordable.

Price competition in any industry assures that there is continual improvement in the production process so as to reduce production cost hence lower selling price.

Concerns about market power, cartel and high prices have been with the cement industry for decades. Although the cartel was officially dissolved in 1996, the industry is still seen as operating within a cartel and cement prices are still high. A number of studies were carried out by De Wet (2003), De Wet (1987), Smith and Fourie (1994), to establish the root cause of these high prices. However, to the researchers knowledge no detailed study has been carried out after the cartel dissolution in 1996.

The majority of South Africans are in need of cement to build decent houses, schools and other essential infrastructures for a better living. This also gives them a chance to be in the economic forefront in the manufacturing industry as owners or co-owners. After 1994 South Africa was open to foreign direct investment, barriers of entry, which were

politically related in the pre democracy era were lifted, this made South Africa to participate in globalisation by allowing multinationals to invest in the country. The implication of foreign investment will be looked at in terms of cement prices hence competition in the industry.

The South African cement industry has undergone transition from being a cartel of four cement producers among PPC, Alpha, NPC (Cimpor) and Blue Circle now known as Lafarge after the acquisition of 1998. The South African Competition Commission ruled out the cement cartel in 1994 but only finally implemented it in September 1996. This ruling marked the end of the cartel in the cement industry established in 1988. The cartel allowed the four companies exemption from the Competitions Act, so that they were free to collude on issues such as price and market share. They argued that the cartel was justified, given the capital-intensive nature of the industry, the high investor risk, and high transport costs among other things (Business Day, 2002). However in 1994, the Competitions Board found that these factors were not unique to the cement industry resulting to the end of the cartel in 1996.

Chief among the changes in the sector since then has been an increase in cement prices and the availability of a wider range of cement products. Customers and the Competitions Board argue that a true termination of the cartel would have led to an increase in competition, with a subsequent decrease in cement price. However, Jones (2002) sales and marketing manager at PPC Cement said prices increase has been in line with international trends (Business Day, 2002).

Another price hike in the cement industry has been once again blamed on Spoornet's prices and inefficiency as contributing to rising cement prices. Jones said problems with rail availability had forced the cement producers to switch to more expensive road transport in some instances. Further

Alpha and PPC said price shifts were not based on attempts to come in line with international pricing or to move towards import parity pricing (Business Day, 2002).

Lafarge Chief Executive Officer declined to comment on the price strategy issue. Could this be viewed as the end of the four producer's cartel to only two?

With new role players in the cement industry in South Africa such as Lafarge and Cimpor, which are world leaders in cement production, competition is likely to be intensified in this sector to the benefit of the end user. Alpha also is an international company under the Holcim Group and is rated second in the world after Lafarge group "(Lafarge, 2004)". It is therefore clear that with more international companies coming to operate in the country, the price war will ensue stimulating the market and the dominance of PPC in the industry could be tested.

Another point that will shape the operation of this sector is the new Mining Charter that has been passed by parliament "(Department of Mineral and Energy Affairs, 2005)".

The charter states that twenty six percent shares should be in the possession of black ownership in five years. Since the cement industry fall under the mining industry, this charter therefore affects it. This could accelerate or retard the market stimulation in the cement industry. However this could truly bring an end to the cartel the industry has been perceived to operate under.

1.2 Objectives of the Study

This study is aimed at looking how the South African cement industry will be shaped by the factors mentioned earlier, that is the new competition in the industry if there is any and the mining charter.

Furthermore the study looks at the theoretical background of the cartel and collusion, its consequences from both business and social point of view. It also looks at the background of the mining charter and how this might shape the market of the South African cement industry.

1.3 Scope of the Study

Provincial market share, concentration, profitability and prices are crucial in establishing the status quo of competition in the cement industry. The media publications are also taken into account in establishing the application of the mining charter hence its effectiveness in shaping the market and improving socio-economical independence of the previously disadvantaged individuals.

1.4 Importance of the Study

This study attempts to measure if the cartel dissolution of 1996 has yielded the reduction in the cement price to the benefit of the end user particularly previously disadvantaged individuals. The outcome of the study should therefore establish if the government objectives of RDP houses and other key infrastructures for an example bridges, roads and dams are all realized at a reasonable budget.

1.5 Study Environment

The study is conducted within the South African environment, national and provincial data are sought for market share and concentration analysis. The data collection is expected to be difficult since the cement retailers and producers are secretive with this kind of information.

1.6 Plan of the Study

Chapter one leads the reader to clear the understanding of the background and the objectives of the study. In chapter two the theoretical foundation of the study is given. The literature survey is dealt with in chapter three. In chapter four the problem is stated. An exposition the research design and analysis is given in chapter five. The results and interpretation thereof are dealt with in chapter six. In chapter seven the outcome of the study is discussed, and it ends with the general conclusion and recommendations.

CHAPTER 2: THEORETICAL FOUNDATION OF THE STUDY

2.1 Introduction

This chapter provides the theoretical foundation on cartels, the fundamental factors that facilitate or hinder cartel formation and methods of operation, consequences, and competition law and policies generally accepted worldwide; cases and research papers carried out in Europe and the United States of America substantiate these. These theories form the basis for understanding the cement cartel and competition in the South African context.

2.2 What is a cartel?

The International Economic Policy seminar paper (2002) describes a cartel as a collusion of firms or producers and attempt to set prices or output to maximize total (or producers) profits. This paper explicitly mentions the strategy producers follow to operate in a cartel. Frequently it comes via quantity restrictions in order to increase prices, while they have advantage of economies of scale. Members of the cartel have the option of defecting or cooperating with the cartel. Most likely, members of a cartel act in its own interest hence will pursue a strategy (defect or cooperate) accordingly. The increased profitability is shared between cartel members, according to production levels. If one producer has a cost advantage over the others that is more efficient so that its marginal cost is lower for all production levels, then it will necessarily increase production in equilibrium.

However, an operation such as this is surely unstable as there is always a risk to cheat. If one of the producers believes that the other will stick to the cartel agreement, then it will be tempted to defect. Even worse, if it

thinks that the other will defect, will therefore try to defect first. This creates then an environment where safeguarding rules are created, therefore in the cartel arrangement, cartel members interact repeatedly over time (not a one-shot game), this opens the way to the possibility of punishment to defectors, or retaliation, lowering the potential value of defecting, but strengthens cooperative behavior. Having a portfolio where all participants are stakeholders may also strengthen the cooperative behavior (Net, 2003)”

Cartels have traditionally been seen as detrimental to social welfare and inefficient in preventing entry and competition of the new products. Further, the traditional view is that cartels are inefficient to the extent that they approximate the behaviour of a monopolist. However Levenstein and Suslow (2003), in their contribution, survey the immense cross-sectional and case study literature on cartels. They found that the average duration of a cartel agreement (in the cross-sections) ranges from 3.7 to 7.5 years. They further found that in addition to the problem of cheating and enforcement, cartel success also depends on a number of other factors: demand-side characteristics, the rate of technical change, the homogeneity of member firms, and organizational factors such as the decision-making procedure, as well as government policies. They astutely make the point that many, if not all of these factors are interdependent.

2.1.1 Forms of Cartel

- *Cournot Model:* firms independently choose outputs on the assumption that their rivals make no response to their choices and market equilibrium is achieved through a sequence of alternating output choices which converges over time (Aldaba: 2000).
- *Stackelberg Model:* a leader makes a choice of output, the other firms act as followers and make their profit-maximizing response to

this output. The leader takes account of these responses in choosing its output and is able to do better than it would under Cournot reactions (Aldaba: 2000).

- *Kinked Demand Curve Model:* each firm believes that an increase in its output (reduction in its price) will be matched by its rivals, while a reduction in output (increase in price) will not be followed. This creates a kink in the firm's perceived demand curve at its current price-output pair, which then tends to remain the same despite changes in marginal cost, because of a discontinuity in the firm's marginal revenue at the kink (Aldaba: 2000).
- *Bertrand Model:* again in the traditional story firms independently choose prices, on the assumption that their rivals make no response to their choices. When firms produce identical outputs and have identical constant marginal costs equilibrium price ends up equal to this common cost (Aldaba: 2000).
- *Edgeworth Model:* firms choose prices as in the Bertrand model, with identical constant marginal costs, but with fixed output capacities. There is a range of possible types of outcome and the possibility of price cycles. There is a range of prices the upper and lower limits of which are determined by demand, cost, and capacity parameters. As firms set prices alternately over consecutive periods, price falls by small steps from the upper limit of the interval until it reaches the lower limit and then jumps back to the upper limit and the cycle begins again (Aldaba: 2000).

All these oligopoly models are examples of non-cooperative games. In general, collusion results in the smallest industry output and the highest price. Bertrand equilibrium, the competitive equilibrium, gives the highest

output and the lowest price. The other models provide results that are in between these two extremes (Aldaba: 2000).

Aldaba (2000) elaborates that many theorists see the above models as giving analytical precision to the idea of tacit collusion. This would not involve explicit agreement but simply the unspoken acceptance by the firms that it is in their best interests to produce the monopoly output on the understanding that failure to do so would provoke a price war. Implicit coordination may be achieved simply through market interactions without any communication or negotiation between firms. There would be no evidence of firms' having met or having discussed the coordination of market behavior. The only evidence that will be available relates to firms' market behavior. As in the case of an explicit enforcement mechanism, the operation of implicit mechanisms will require information. To be sustainable, information on each other's costs, outputs, prices, and discounts is necessary. The greater the number of firms and the more product heterogeneity; the greater this information requirement expands.

In the real world, there are many facilitating devices that have been developed to help firms achieve successful tacit collusion (Aldaba, 2000).

These include:

- Trade associations: In many industries, associations are usually organized to handle public relations, organize conventions, trade fairs, etcetera. However, they may also act as facilitating devices as in collecting and disseminating information on costs, outputs, prices, and policing both tacit and explicit agreements.
- Price leadership: In this practice, the dominant firm first announces price changes and the other firms follow within a short period of time. It is also possible for a non-dominant firm, which is considered

the best at judging market conditions to play this role. This practice of price leadership is a way of addressing the problem of choosing one price agreement in the set of possible agreements. If the leader is good in selecting mutually acceptable prices, the agreement can be entirely tacit.

- Basing point price: this is a pricing system where transport costs are high relative to production costs and buyers and sellers are spatially dispersed. It is common in industries like steel and cement. Delivery prices are computed based on base prices and transport charges. This arrangement often results in delivered prices, to any buyer that is always uniform across sellers and there is no price competition. Sellers must exchange information on base prices and transport charges, but no explicit agreement to collude on prices is made.

There are also many opportunities for company officials to make their views known to each other on the state of the market and the direction prices should take, for example, in newspaper interviews, articles in trade publications, or in speeches.

2.3 Factors that facilitate or hinder collusion

The theoretical literature on cartels is primarily concerned with the compliance by independent firms with agreements that reduce competition within a market. Because anticompetitive practices are illegal, these arrangements cannot be the object of legal contracts and, as a consequence, can only exist if they are self-enforcing. Indeed, this is the way in which economists understand the term 'collusion': as a cooperative arrangement, that is self-enforced (Gilo, 2005). This definition does not imply that the collusive agreement is reached without resorting to communication. Rather, the emphasis is placed upon the self-sustainability

of the arrangement, which is necessary in virtue of its illegality. Although communication plays no part, or is assumed away, in the majority of theoretical models of collusion, some recent work has started to shed light into its role.

To model self-enforcing agreements, economists have borrowed from the theory of repeated games. The analogy with repeated games arises because cooperation requires single firms to depart from their myopically optimal actions. In the absence of legally binding agreements, cooperation in the present may therefore only be sustained by the threat of future punishment in the event of a deviation. Hence in economic theory, firms can maintain collusive prices only if they can credibly threaten to punish deviations by aggressive competition in the future. Clearly, this presupposes repeated interaction. Moreover, collusion can only be sustained if interaction is infinitely repeated. Unless this is the case, the threat of future punishment cannot possibly act as a deterrent.

At the most general level, the sustainability of collusion depends on the interplay of the size of the (short-lived) gain that can be obtained by deviating from the collusive agreement, and the (long-run) opportunity cost of the resulting reversion to non-cooperative interaction (punishment). In particular, collusion is sustainable only when the potential short-term gain from a deviation is outweighed by the long-run losses from a price war. This is the necessary condition that must hold, in order for collusion to be feasible (Gilo, 2005).

The industry characteristics are reviewed has singled out by literature as being relevant when assessing the sustainability of collusion within a market. It should be noted that these characteristics are neither necessary nor sufficient for collusion to be sustained, but simply affect the likelihood that collusion might be sustained.

2.3.1 Number of firms

Grout and Sonderegger (2005) expect the correlation between the number of firms and the incidence of collusion within a market to be negative. This conclusion arises from the following considerations. Firstly, a high number of participants increase the probability that firms with different costs of production might coexist within the market. As explained later, this decreases the likelihood of collusion. Secondly, a large number of participants make deviations from the collusive agreement harder to monitor. Thirdly, as the number of firms increase, each firm gets a lower share of the pie. This makes:

- Deviations more tempting and
- Punishments less costly.

Finally, when the cartel does not include all market participants, an increase in fringe size diminishes the stability of collusion by decreasing the total market share that the cartel is able to capture.

The Methionine and Lysine cases discussed below. provide good illustrations of these ideas. In both cases, cooperation was disrupted by the access to the market of a large new entrant; ADM in Lysine, Monsanto in the Methionine case. This made the cartel unstable, and eventually resulted in its collapse. In the Citric Acid case, for instance, the market leader Jungbunzlauer was perceived as being the major cause of trouble, and was attacked especially by ADM and Hartman & Reimer, the third and fourth largest members of the cartel. These difficulties carried on until, in 1995, it became clear that the cartel was in total disarray and was not working. Similarly, in the Lysine case, the frequent clashes between Ajinomoto and ADM, the two largest cartel members resulted in Ajinomoto eventually approaching the Commission to denounce the agreement. Similarly, in the Methionine case after Monsanto entered the market, the participants started having difficulties in coordinating. This was because

Rhone-Poulenc and Degussa, the two largest cartel members, had 'somewhat different agendas' on how to react to Monsanto's low prices. Eventually, the cartel came to an end in 1999, when Rhone-Poulenc (now Aventis) revealed the cartel's existence to the Commission (Grout and Sonderegger, 2005).

2.3.2 Entry barriers

Grout and Sonderegger (2005) highlight that if entry barriers are low, high prices in the present will attract new competitors in the future. This decreases the future gains from collusion, making punishment less costly to bear. In markets where entry barriers are low, collusion is therefore harder to sustain, independently of the actual number of market participants.

A similar reasoning applies to markets where entry barriers are presently high, but expected to lower in the future. Consider a product that is protected by a patent, and suppose that the patent is to expire within a couple of years. The incumbent firms know that after the patent has expired, entry in the market will be unrestricted. If production does not entail significant fixed costs, this implies that after the expiry date the market will become perfectly competitive. Thus, collusion is necessarily short-lived and, as such, cannot be sustained.

2.3.3 Capacity constraints/stocks

Grout and Sonderegger (2005) concluded that the role played by capacity constraints on the feasibility of cartels is ambiguous. On one side, a capacity constrained firm has less to gain from undercutting its rivals, as it is able to accommodate only a fraction of the extra demand this would generate. On the other side, however, capacity constraints limit firms'

retaliatory power. This is because the strongest penalty that firms can envisage is to produce at full capacity.

Brock and Scheinkman (1985) provide a good illustration of this ambiguous effect. Within a symmetric setting - where all the firms in a market have the same capacity constraint - these authors show that a non-monotonic relationship exists between cartel sustainability and the size of the capacity held by each firm. When industry excess capacity is sufficiently small, the deviation-inhibiting effect of capacity constraints dominates. This implies that adding additional capacity makes collusion harder to sustain. When industry excess capacity is sufficiently large, on the other hand, the punishment-reducing effect of capacity constraints dominates. Adding additional capacity, therefore, makes collusion easier to sustain.

While Brock and Scheinkman (1985) treat capacity constraints as exogenously given, Davidson and Deneckere (1990) explicitly model the firms' capacity. They find that excess capacity is carried in all collusive equilibria. This is because excess capacity is necessary to punish deviations from the collusive scheme. In this setting, therefore, large capacities are a necessary condition for collusion to occur.

In the Petrochemical cartel, for instance, this effect comes out very clearly: the sharp demand downturn that preceded the formation of the cartel resulted in structural overcapacity in the whole European market. The problem was so severe that during the period immediately preceding the formation of the cartel, producers were often operating below break-even levels. It is in this climate that the cartel members started to meet, in order to figure out a way to 'share the pain' (Grout and Sonderegger, 2005).

Compte (2000) analyze the effect that asymmetries in capacity constraints have upon the sustainability of cartels, focusing on the joint impact of asymmetry and aggregate capacity. Their findings share some similarities with those by Brock and Scheinkman; the introduction of asymmetric capacities favours collusion when aggregate capacity is large, but hinders collusion when aggregate capacity is limited. This has interesting implications for assessing the impact that horizontal mergers may have upon the likelihood of collusion within a market. On one hand, a merger reduces the number of competitors within a market, thus facilitating collusion, on the other hand, however, a merger also exacerbates the asymmetries in capacities within the market (this is especially true when the merger involves the largest firms). If aggregate capacity is limited, this second effect hurts the firms' ability to collude, as it creates a new entity that is extremely hard to discipline. The implication is that mergers are not necessarily anticompetitive. On the contrary, by hindering collusion mergers might actually promote competition within a market.

In several cases, cartel formation was preceded by a spell of intense competition, typically characterized by the expansion – through acquisition and/or the building of new capacity – of one of the smaller incumbents, or by the access to the market of a large new entrant. This evidence suggests that a decrease in the degree of asymmetry of the distribution of excess capacity facilitates collusion. On the other hand, however, the case studies also report that those cartels that were created following a reduction in the degree of asymmetry of excess capacity were generally unstable. This suggests that similarities in capacity constraints might be detrimental for cartel stability.

This dichotomy is particularly well illustrated in the Citric Acid case, where the period immediately preceding the formation of the cartel was characterized by a massive increase in the production capacity of

Jungbunzlauer, which allowed Jungbunzlauer to become one of the market leaders, along with Hoffman-La Roche, ADM and Haarmann & Reimer. The result of this expansionary campaign was that Jungbunzlauer virtually tripled its production capacity for citric acid, mainly through the acquisition of Boehringer Ingelheim's citric acid manufacturing business in 1985 and Benckiser's organic acid division in 1988. Thus, the case suggests that the reduction in the asymmetries in capacity operated by Jungbunzlauer's expansion facilitated the formation of the cartel (Grout and Sonderegger, 2005).

On the other hand, however, the case also reports that, the considerable influx of citric acid imports for China, started difficulties between some of the cartel members, especially with respect to the lack of discipline on the part of certain members vis-à-vis adherence to the agreement. The market leader Jungbunzlauer was perceived as being the major cause of trouble, and was attacked especially by ADM and Hartman & Reimer, the third- and fourth- largest members of the cartel.

These difficulties carried on until in 1995. Eventually, it became clear that the cartel was in total disarray and was not working. That same year, the cartel was discovered and dismantled by the Commission.

Thus, the case also demonstrates that similarities in capacity constraints might be detrimental for cartel stability.

2.3.4 Demand/demand stability

Rotemberg and Saloner (1986) explore the response of oligopolies to fluctuations in the demand for their product. Taking a simple but illustrative view of the business cycle, they assume that the level of market demand is determined in an independent fashion each period, so that the expected level of future demand is independent of the current

demand level. This ensures that the expected cost of punishment is independent of the present state of demand. Today's demand level, however, does affect the short-term incentive to cheat, since a price-cut is more attractive when demand is high. Intuitively, when the economy is experiencing a temporary boom, the temptation to undercut the collusive price, and capture the entire market, is stronger than – while the expected opportunity cost of punishment is the same as – when the economy is in a temporary slump. The implication is that, when demand is temporarily high, collusion is harder to sustain. The same argument can be applied to show that when demand is temporarily low, collusion is easier to sustain.

Haltiwanger and Harrington (1991) relax the assumption of demand independence across periods, and introduce a more realistic model of business cycle, where demand movements are cyclical over time. They show that the most difficult point of the cycle for firms to collude is when demand is at its highest. Thus, collusion is more likely to break up when demand is currently high, but is expected to fall. The intuition behind the result is that, when demand is at a peak, short-term gains from deviation are maximal, because the economy is experiencing a boom, while the opportunity cost of punishment is at a minimum, because the economy is entering into a recession. By the same token, collusion is less likely to break up when demand is currently low, but is expected to grow. This is because when demand is at the lowest point of the business cycle, current gains from deviation are low, as the economy is currently in a recession, but future gains from collusion are high, because the economy is entering into an expansionary phase.

Case studies indicate that unexpected negative shocks to demand are often associated with the emergence of collusive behavior. For instance, in the French Beef case, six federations were fined for having taken part in an agreement to set a minimum price for some categories of beef and to

suspend or, at the very least, limit imports of all types of beef into France. The cartel was set up in October 2001, one year after the beginning of the crisis that had been triggered by the discovery of the mad cow disease; the crisis had started in October 2000, and had resulted in a significant decline of prices.

Similarly, in the German Banks case, five German banks were convicted for agreeing to charge no less than 3 per cent for the buying and selling of euro-zone banknotes. The agreement was aimed at compensating the banks for the future abolition of the lucrative selling and buying 'spread' charged by banks to exchange euro-zone currencies. This abolition occurred in 1999, when the bilateral exchange rates for currencies of the European Union became irrevocably locked.

Bagwell and Staiger (1997) extend the analysis to persistent business cycles –situations where demand movements are stochastic and persistent. They find that collusion can be more easily sustained if the expected duration of booms is sufficiently long, and that of recessions is sufficiently short. Moreover, transitory shocks make collusion harder to sustain, independently of whether the market is in a boom or a recession.

Staiger and Wolak (1992) explore the response of collusive prices to changing demand conditions when firms operate under capacity constraints. In their setting, periods of unexpectedly low demand result in the emergence of excess capacity. This, they argue, may destabilize the collusive agreement. Interestingly, Steiger and Wolak's prediction is at odds with the evidence found in the case studies, where the emergence of excess capacity resulting from adverse demand conditions appears to facilitate, rather than hinder collusion.

Based on the above findings, Grout and Sonderegger (2005) drew the conclusion that demand instability hinders collusion. This is because, with respect to the case where demand is stable at an average level, demand fluctuations tighten the requirements that ensure the sustainability of collusion. Moreover, demand growth facilitates collusion. When demand is on an upward trend, future economic conditions are more favourable than present ones. With respect to the case where demand is stable to its present level, demand growth increases the opportunity cost of punishment, and therefore decreases the firms' incentive to deviate from the collusive agreement. It should however be emphasized that this prediction is conditional on entry barriers being sufficiently high. In the absence of barriers to entry, demand growth will trigger new entry in the market. This will, at least partially, counteract the collusion-enhancing effect of demand growth.

2.3.5 Frequency of interaction and price adjustments

Frequent interactions/price adjustments facilitate collusion by shortening the time of reaction to deviations from the collusive agreement. If the amount of time that must elapse before any deviation can be punished is long, the gains from deviation can be enjoyed for longer. This makes deviation more attractive. Moreover, a longer reaction time pushes retaliation further in the future. When firms discount the future, this makes punishment less frightening (Grout and Sonderegger, 2005).

Snyder (1996) argues that the impact of frequency of interaction upon the firms' ability to collude may be particularly important in the presence of large buyers. This is because large buyers can strategically concentrate their orders across time, in order to make firms' interactions less frequent and therefore make collusion harder to sustain.

It should however be emphasized that if firms can communicate, and secretly exchange conclusive information concerning their pricing practices on a regular basis, the relevance of the frequency of market-mediated interactions for the sustainability of collusion is greatly diminished.

2.3.6 Market transparency/private information

The importance of market transparency in determining the sustainability of tacit collusion was first highlighted by Stigler (1964), and subsequently formally established by Green and Porter (1984) and Abreu, Pierce and Stacchetti (1986). The logic of the argument can be seen as follows. Suppose that firms are unable to observe demand conditions, and to monitor their rivals' sales and prices. Moreover, assume that demand randomly fluctuates from period to period. In this setting, firms who register low sales are unable to establish whether this is the consequence of adverse overall demand conditions, or of secret undercutting by rival firms. How should they react?

Suppose that after a period of low sales, firms do not modify their behavior, and stick to the collusive price. This would eliminate any punishment for undercutting, and would therefore encourage firms to deviate from the collusive agreement. It follows that collusion can be sustained only if firms react to low sales by launching a price war. In this setting, this implies that collusion can only be sustained in environments where price wars erupt whenever demand is low.

In comparison to the case where demand is observable, this reduces the expected future benefits from collusion, and makes undercutting more tempting. Thus, in the absence of communication, the firms' inability to distinguish between favourable and unfavourable demand conditions undermines their ability to collude. Importantly, however, this argument

ceases to be valid if firms can exchange verifiable information concerning their sales. If this is possible, firms can verify whether a deviation has occurred by scrutinizing the evidence advanced by their competitors. In this case, the firms' inability to directly observe demand is compensated by their ability to exchange information.

Finally, it is worth noting that the argument advanced by Green and Porter relies on the unpredictability of demand, and would not hold in markets where demand is deterministic. This is because when demand is deterministic, there exists no uncertainty over the current state of demand, and unexpectedly low sales can only result from price undercutting by rival firms (Grout and Sonderegger, 2005).

On a similar note, the existence of private information makes collusion harder to sustain. Roberts (1985), Cramton and Palfrey (1990), Kihlstrom and Vives (1995), Athey and Bagwell (2001) and Athey, Bagwell and Sanchirico (2002) concentrate on the case where firms possess private information about their costs. The idea is that, at any given point in time, some firms may have high costs, while other enjoy low costs, due for instance to variations in local conditions, labor relations, inventory managements and so on.

In this setting, joint profit maximization prescribes that market shares should be inversely related to firms' costs; under constant returns to scale, for instance, when one firm has lower production costs than its rival, joint profit is maximized by allocating all production to the low cost firm. Because firms are unable to observe each other's costs, efficient market share allocation can only be achieved if firms can exchange information over their cost realizations. Thus, communication is necessary for joint profit maximization to occur.

This last point is particularly well exemplified in the Organic Peroxide case, where information exchange was so central to the existence of the cartel that a consultancy company was employed with the sole purpose of organizing meetings, produce 'pink' and 'red' papers with the agreed market shares, and even reimburse the travel expenses of participants to avoid leaving any traces about the illegal meetings.

Although communication is necessary for joint profit maximization, it is however not sufficient; because joint profit maximization requires them to relinquish market share, high-cost firms have strong incentives to misrepresent their true cost realizations. Truthful communication is therefore possible only if higher-cost firms are assured of side-payments, or some other forms of future benefits, by lower-cost fellow cartel members. For instance, in the stylized illustration given above, the high cost firm will not be willing to relinquish the whole market, and therefore earn zero profits from production, unless the low cost firm guarantees an appropriate transfer in exchange. This however decreases the low-cost firm's incentive to abide to the collusive agreement. Thus, a trade-off exists between joint profit maximization and cartel enforceability, even when communication is feasible. As a consequence, enforceable market share arrangements are not necessarily efficient. This reduces the profitability of cartels, and makes collusion less attractive.

Compte (1998), Kandori and Matsushima (1998) and Verboven (1998) study the informational asymmetries that arise when firms hold diverse and imperfect information about each other's actions. This may for instance be the case when competition is somewhat localized, that is each firm only operates within a limited number of local sub-markets, that are not fully distinct but where cheating by one firm in a market can be more easily observed by the subset of firms in the local sub-market. If punishing a deviating firm is costly (for instance because it involves a price war that

penalizes all firms in the market), this creates the following problem: a firm that suspects cheating by one of its competitors may consider concealing this information, in order to avoid having to enforce the costly punishment. Essentially, since the cartel covers the overall market but, say, only a local firm has knowledge of cheating then that firm is now in the position of co-coordinating responses to cheating (since it alone has the information) which may change their incentives to reveal information.

Grout and Sonderegger (2005) make an illustration where three firms are active in the whole market, but firms 1 and 2 are the only firms operating within a certain sub market. Suppose that the collusive agreement prescribes that if a firm deviates from the collusive price, all firms should revert to marginal cost pricing forever. Notice that this punishment results in all firms earning zero profits. The implication is that if, say, firm 2 deviates from collusion in the local market where it competes only with firm 1, firm 1 will strictly prefer to ignore this deviation, rather than trigger punishment, and induce marginal cost pricing across all local markets. Predicting this, however, firm 2 would have no incentive to respect the collusive agreement, at least in the market where it only competes with firm 1.

It can be concluded that, in contrast to a setting where all information is public, the presence of private information imposes an additional constraint, arising from the trade-off that exists between the severity of the punishment that can be imposed after a deviation, and the likelihood that deviations will be discovered. This makes collusion harder to sustain. Compte and Kandori-Matsushima (1998) show that under these conditions communication may alleviate the problem. Thus, in the presence of asymmetric information among firms, communication-enhancing devices such as trade unions may promote collusion.

2.3.7 Cost asymmetries/quality differences

Cost asymmetries and differences in the quality of the products sold by different firms make collusion harder to sustain. In asymmetric settings, low-cost (respectively, high quality) firms are hard to discipline.

This is because the harm that their high-cost (respectively, low quality) rivals can inflict upon them by triggering a price war is limited.

For instance, consider the damage that a firm producing a low-quality good can inflict upon a high quality firm. Even if the low quality good is sold at a slightly lower price, consumers will still purchase the higher quality good, because it possesses a higher intrinsic value. In order for the low quality firm to significantly affect the demand faced by its high quality rival, it must therefore charge a price that is considerably below what the rival is charging. This might however not be feasible, owing to cost restrictions. To compensate, collusive agreements should assign larger market shares to high quality firms, in order to offset the (relative) gains that such firms can obtain from deviation. This however adversely affects the low quality firms' incentives to participate the collusive agreement, creating a trade-off between incentive provision to high quality firms and to their low quality rivals.

The same reasoning applies to cost asymmetries. In order to be induced to participate to the collusive agreement, low cost firms should be allocated larger market shares. This however makes collusion less attractive for high cost firms. Grout and Sonderegger (2005) conclude that cost asymmetries/quality differences make collusion harder to achieve, by limiting the range of market shares that are consistent with collusion.

An interesting application of this general point concerns the impact of innovation upon collusion. Because innovation fosters asymmetries in

costs and/or qualities, therefore collusion is less likely in innovative markets.

2.3.8 Horizontal product differential

Grout and Sonderegger (2005) find the effect of horizontal product differentiation upon the sustainability of collusion ambiguous. When products are horizontally differentiated, different consumers rank equally priced products differently. This is because goods possess characteristics that appeal to different types of consumers. With respect to the situation where all goods are perfect substitutes, this decreases the elasticity of demand faced by any single firm. For any given price differential, consumers are more reluctant to abandon their favorite variety.

On one hand, this results in firms finding deviations less attractive; because the extra demand that firms can capture by slightly undercutting their rivals is limited. By the same token, however, a lower elasticity of demand also restricts the firms' retaliatory power, by limiting the harm that can be inflicted upon other firms by launching a price war. The net result of these opposing forces depends upon the exact nature of the case under scrutiny.

Raith (1996) studies the impact of horizontal product differentiation upon the sustainability of collusion when firms are unable to observe the actions of their rivals, but can nonetheless draw inferences from their own demand.

In this setting, differentiation decreases the correlation between the demands faced by different firms. This results in deviations being harder to detect, and in collusion being harder to sustain. It can be concluded that, when market conditions are not transparent, horizontal product differentiation makes collusion harder to sustain.

Symeonidis (2002) considers the case where firms can sell more than one variety of a product, and finds that collusion becomes harder, the larger the number of varieties sold by each firm. This is because a rise in the number of varieties sold by a firm increases the profit that the firm can obtain by deviating from collusion (for example, by becoming the market's sole supplier, albeit for a limited amount of time) more than it increases the profit that the firm obtains when it sticks to the collusive agreement (for example, when it shares the market with other firms). It follows that selling a higher number of varieties increases the benefit from deviation more than it increases the opportunity cost of punishment.

2.3.9 Multi-market contact

When firms encounter each other in several markets, the multiplicity of their contact may blunt the edge of their competition (Edward, 1955). Bernheim and Whinston (1990) formalize this intuition by precisely identifying the conditions under which it holds. Intuitively, multi-market contact acts as an expansion of the market where the firms compete. This has an ambiguous effect: on one hand it magnifies the gains of deviation, while on the other it increases the strength of the resulting punishments. In a perfectly symmetric setting - where identical firms with identical, constant-returns-to scale technologies meet un-identical markets - these opposing forces exactly annul each other. In that case, multi-market contact has no impact upon the sustainability of collusion. In contrast, when markets and/or firms differ, or when technology exhibits decreasing returns to scale, multi-market contact may foster collusion. This is the case because the presence in several markets softens/offsets the anti-collusive incentives that may be generated within single markets.

To illustrate this point, consider a situation where firms have different costs of production, which are negatively correlated across markets. In

that case, multi-market contract facilitates collusion, by allowing each firm to hold higher market shares in those markets, where it is more efficient. This allocation ensures that the greatest fraction of the extra demand that firms would generate by undercutting would come from the market where they have higher costs. At the same time the greatest fraction of the profits lost in the event of a price war would come from the market where firms have lower costs. The first effect decreases the firms' gains from deviation, while the second effect increases the costs of punishment. The conclusion is that multi-market contact relaxes the requirements that are necessary to sustain collusion.

2.3.10 Cross-ownership

There are many cases in which firms acquire their rivals' stocks as passive investments that give them a share in the rivals' profits but not in the rivals' decision-making. Malueg (1992) and Gilo and Spiegel (2003) study these passive investments /cross ownership patterns, and show that they may have two opposing effects upon the firms' inclination to collusion. On one hand, cross ownership weakens the incentive of firms to deviate. This is because firms internalize part of the losses that they inflict on rivals when they deviate. On the other hand, however, cross ownership may also soften the firms' incentive to impose a harsh punishment, following a breakdown of the collusive scheme. This makes deviation more tempting.

Finally, cross ownership facilitates communication. This decreases the informational asymmetries that exist among firms, and, as seen above, might therefore facilitate collusion. However, enhanced communication also encourages renegotiation, and might therefore render collusion harder to sustain.

Grout and Sonderegger (2005) concluded that cross ownership agreements have an ambiguous effect upon the sustainability of collusion.

2.3.11 Buyer power

Large, powerful buyers make collusion harder to sustain. Because buyers benefit from price wars between sellers, large buyers will utilize their power strategically, in an attempt to break any collusive agreement that may exist among the sellers. This may for instance be achieved by concentrating orders across time, in order to make the sellers' interactions less frequent (Snyder, 1996) or by shading current demand, in the hope that this will lead sellers to believe that a secret price cut has occurred (Compte, 2000).

2.3.12 General remarks

The theoretical literature on collusion has until recently underestimated or ignored the role-played by communication in the sustainability of cartels. This is because, as a science, economics is chiefly concerned with equilibrium outcomes, and not with the specific manner in which these outcomes are attained. Within the context of collusion, this implies that not much emphasis has been placed upon the role of communication, and the exchange of information among firms, as the vehicle through which cooperation is achieved and sustained. In contrast, the legal literature qualifies as collusive only those agreements that are jointly arrived at, as a result of explicit communication. This creates a potential dichotomy between theoretical speculation, on one hand, and practical concerns, on the other. Economic theory fails to meaningfully account for one of the very factors – namely, communication – that define collusion legally (Grout and Sonderegger 2005).

Grout and Sonderegger (2005) reviewed the factors that the economic literature highlighted as affecting the likelihood of collusion within a market. The theoretical predictions that are constructed under the assumption that cartel members are unable to communicate were singled out. This is true, for instance, for the arguments advanced when discussing the role of market and price transparency, and private information, in the sustainability of collusion; clearly, the ability of cartel members to exchange (verifiable) information might counteract the effects described by the economic theory. For example, if the exchange of information on sales and prices allows firms to conclusively verify whether a deviation from the agreement has occurred, then we should expect the extent to which sales and prices are publicly observable within a market (transparency) to have no effect upon the firms' ability to collude. Similar concerns might be expressed with respect to frequency of interaction/price adjustments, and buyer power. It should be noted however that the necessity of frequent and detailed communication for the sustainability of collusion in the presence of specific characteristics also implies that cartels are most likely to be discovered – and convicted – precisely within those markets that possess these characteristics.

With regards to the other factors deemed to affect the likelihood of collusion – such as barriers to entry, number of firms, demand characteristics, cost asymmetries and product differentiation – the conclusions drawn by the literature do not appear to depend upon the firms' inability to communicate. Indeed, the relevance of these factors, and the influence that they might have upon the market participants' ability to collude, appear to be robust to changes in the degree of communication among firms.

However, the point made above – that the need for cartel members to communicate intensifies precisely when collusion is harder to sustain – is

still valid. This observation suggests that parties might be more likely to engage in overtly collusive practices specifically in those circumstances that are predicted by the theory as being adverse to collusion.

2.4 Symeonidis Study

Below is the review extract carried out by Levenstein (2005), on the book by Symeonidis, his findings and theories are found to be in line and useful in the analysis of the South African cement industry.

The book examines the impact of the 1956 Restrictive Trade Practices Act. This Act effectively outlawed most price fixing agreements in Great Britain. Symeonidis is particularly interested in two related questions. First, what was the impact of this increase in competition on the level of concentration of British industry? Second, what was the effect of increased competition on innovation and advertising in British industry? He finds that, in all industries, the ban on cartels and the resulting increase in competition led to increases in industry concentration. He argues that increases in competition decreased profits; those profits were restored by reductions in the number of firms in the industry. He finds that, in industries that spent a lot on advertising, those expenditures fell slightly following the elimination of cartels. Advertising was apparently an alternative to price competition. When price competition increased, firms no longer needed and could no longer afford the same level of advertising expenditures. Concentration increased in advertising-intensive industries, but the increase in concentration took place over a longer period of time than in industries with relatively low levels of advertising. He finds that, in industries that spent a lot on research and development, the rate of innovation, both as measured by R&D expenditures and as measured by innovative output, did not change as a result of the increase in competition. But the resulting increases in concentration in R&D-intensive

industries were quite substantial.

Symeonidis (2005) addresses two theoretical issues that are central to industrial organization. First, he quite explicitly critiques the Structure-Conduct-Performance paradigm. In particular, he rejects the argument that, industry structure and the level of concentration, determines industry conduct thus the intensity of competition. Instead he builds on the work of his advisor, John Sutton, to turn S-C-P on its head, arguing, firm conduct, which is partly determined by exogenous institutional factors, is an important determinant of market structure (Competition: Cartel Policy and the Evolution of Strategy and Structure in British Industry, 2003). That is, market structure is not determined by the size of the market and the technology of production. It is determined as well by the strategies pursued by the firms in the industry, by the institutions that govern the nature of competition in the industry, and by the history of competition and cooperation in the industry. This is the most profound point of this whole line of research and it is borne out by this work.

Empirically, Symeonidis finds that there is a simple correlation between industry concentration and the existence of a collusive agreement in the industry. But he argues that capital intensity is what actually increases the likelihood of collusion and that once capital intensity is controlled; the apparent correlation between industry concentration and the propensity to collude disappears.

There is no evidence of any linear association between concentration and collusion, although a non-linear relationship is present in some regressions, with both very low and very high concentration hindering collusion. There is strong evidence that collusive pricing is less likely in advertising-intensive industries than in low-advertising industries, and weak evidence that it is less likely in R&D-intensive industries than in low R&D-industries.

The second major issue that Symeonidis focuses on, is the relationship between concentration, competition, and innovation. Much of the existing literature takes industry structure and firm size as exogenous and asks whether more concentrated industries of larger firms are more or less innovative than industries made up of many small firms. Symeonidis's approach, again following Sutton, treats industry structure as endogenous and the intensity of competition as exogenous. He argues that, if firms are competing intensely, then small firms in an un-concentrated industry will not be able to recoup their investments in R&D. The only way to support R&D if firms are competing intensely in price is to reduce the number of firms in the industry. If price competition is less intense, then an un-concentrated industry structure can still support high R&D investment. His empirical finding is consistent with this argument. When the intensity of price competition increased because of legal changes, firms did not decrease their expenditures on R&D. Instead, concentration in these industries increased, reducing the average number of firms in an industry by about twelve percent and increasing the five firm concentration ratio by about ten percent. He hypothesizes that the impact of increased competition was on concentration rather than on R&D expenditures because of the nature of competition in industries that invest a lot in R&D. Any firm that chose to spend less on R&D would quickly become unable to compete at all in an industry where innovation is important. So firms either maintained their R&D expenditures or exited; there was no in-between option.

Symeonidis does find evidence of a strong negative relationship between collusion and the number of innovations produced across UK manufacturing industries within the high R&D intensity industries during the 1950s. In fact, his measure of innovativeness is three times as high for industries without cartels as those with them. But he argues that this does not necessarily mean that collusion undermines innovation. Most of the inter-industry differences in innovation are attributable to "time-

invariant industry characteristics such as technological opportunity and other variables difficult to measure or to observe, including random events". In industries with high returns to R&D, Symeonidis argues, it may simply be harder to maintain collusive agreements.

He finds a somewhat different empirical result in his study of advertising-intensive firms. His analytical model of advertising is essentially identical to his model of R&D. Firms choose to invest in either R&D or advertising; by doing so they increase consumers' willingness to pay for their products in the future. In different industries, the effect of R&D or advertising on consumers' willingness to pay differs, but the payoff is known in advance and is completely exogenous. But while for R&D-intensive industries, the effect of increasing competition was felt solely in increased concentration, with no change in R&D expenditures, the effect of the 1956 Act in advertising-intensive industries was felt both in advertising expenditures and in increased concentration. Symeonidis argues that the reason for the difference in the impact of advertising and R&D is that while high-intensity and low-intensity advertising firms can co-exist within a single industry, competing against one another, it is much harder for low-R&D firms to compete against high-R&D firms, by offering a low price. So there is more homogeneity within industries with respect to R&D than there is with respect to advertising.

Symeonidis finds that industries without cartels have much higher advertising expenditures than cartelised industries. He argues that this is not the result of collusion to reduce advertising expenditures; rather firms are more likely to turn to collusive pricing in industries where advertising is ineffective. He argues that this is why during a period of declining advertising intensity (because of the advent of television and other exogenous changes), advertising fell more in formerly collusive industries than in non-collusive industries. Those were industries in which advertising was less effective to begin with.

Symeonidis's treatment of advertising will not be entirely satisfying to advertising historians who have analysed in detail the active role that firms play in shaping their markets and their consumers to influence "the effectiveness" of their advertising capital. But even if Symeonidis's assumption of the exogeneity of advertising effectiveness is not literally correct, it is still useful to the advertising historian to learn how an increase in competition affects firms' investments in advertising. Symeonidis is careful enough in framing his questions that none of what he finds is vitiated by the assumption of exogeneity. Symeonidis's finding that the 1956 change in competition policy led to a decline in the number of explicit price-fixing agreements in British industry, and that the resulting increase in competition led to a subsequent increase in concentration will ring familiar to the ears of many. U.S. economic historians have frequently noted a similar pattern following the introduction of anti-trust prohibitions in the United States in the late nineteenth century. In the United States the 1890 Sherman Act ban on price fixing preceded by twenty-five years the Clayton Act regulation of mergers. In the intervening twenty-five years, concentration increased significantly in a large number of U.S. industries. Current European Union policy is similarly quite clear and explicit about limitations on price fixing and output restrictions, but the European Courts have limited the European Commission's attempts to enforce a rigorous merger policy. Ongoing discussions in the World Trade Organization and among developing countries favour a sequencing of competition policies, with bans on explicit price-fixing and output-restriction preceding the development of merger policy. Symeonidis's work provides a timely reminder about the unintended effects of such sequencing. Rather than achieving greater competition, we may instead find ourselves with greater concentration. That increase in concentration will not be reversed by itself, but can have long-lasting effects on things as varied as the direction of innovation and in important industries like communication and media, the

vibrancy of democracy.

The theoretical model presented in the book assumes that the profits of the firms that remain in the industry increase as other firms exit, but the mechanism for this increase in profit is not made explicit. In particular, it is left open whether the increase in profits arises from an increase in prices; say as a result of Cournot competition, or a decrease in costs, as a result of higher cost firms being the first to exit the industry. Symeonidis is careful not to rule out either of these possibilities. And while they are both consistent with the theoretical and empirical findings of the book, the difference between the two, increases in price or decreases in costs, is extremely important for policy analysis.

The process by which concentration adjusts in response to changes in profits is through entry and exit. Thus the assumption of free entry and exit, even in the presence of collusive agreements, is critical. Symeonidis specifically tests this assumption in the book. He finds that long-run profits do not change for firms in formerly collusive industries (though they do dip following the dissolution of their cartels). He argues that if cartels had created barriers to entry, long run profits would have fallen after the demise of the cartel. Another possibility is that the actions that cartels take to restrict entry, such as creating joint distribution mechanisms or restricting the diffusion of technological knowledge, may continue to restrict entry even after formal collusion is abandoned. He stresses that the monitoring of entry conditions into industries is a key priority for competition policy.

Symeonidis's analysis of the effect of the 1956 Restrictive Trade Practices Act on research and development and advertising expenditures also depends on the assumption that these strategic variables were not themselves the subject of collusive agreements. Rather, changes in R&D and advertising in formerly collusive industries are the result of increases in price competition among the extant firms, not the result of a change in

the collusive agreement per se. He has carefully examined the agreements among the firms in his sample and notes that it was quite rare for them to include any agreement or restrictions on investment, R&D, or advertising. The one exception to this was in the electrical and electrical equipment industries, where patent pooling agreements were quite common. There have been several important recent theoretical contributions that model "semi-collusion" where prices are agreed upon but investment is not.

Caution should be taken not to presume that this finding could be extended, that collusion focuses on prices and quantities and ignores other important strategic variables, such as advertising and investment, to other cartels. As Symeonidis acknowledges, these agreements were written in a particular historical, legal, and institutional context. Many of these agreements were made in relatively un-concentrated industries and were explicitly open to any new entrants to the industry. He even speculates that the agreements that were submitted were often somewhat different from industry practice prior to the passage of the 1956 legislation, as they were crafted so as, hopefully, to meet the approval of the Monopolies and Restrictive Practices Commission. (Most did not.) Thus they were quite explicitly relatively weak agreements. That has not always been the case in more recent, secret, illegal cartels. For example, in a recently prosecuted international cartel, trial testimony indicates that graphite electrode manufacturers from the U.S., Japan, and Germany did discuss long-term investment plans and modify them to facilitate continued collusion.

One important question is whether or not the agreements Symeonidis studies were actually effective. This is particularly relevant given the convincing evidence that entry was easy and was accommodated by incumbent firms and that the agreements did not restrict investment. Symeonidis argues that they were effective, but what he shows is that members followed the agreements, not that the agreements raised prices

above or restricted output below "competitive" levels: "The available case-study information on collusive prices also supports the view that the agreements were, in general, effective. Prices of outside firms were typically lower than the cartel prices, although sometimes they were identical or only marginally lower.

Thus it is possible that in many industries eliminating formal agreements had little effect on the intensity of competition. Still, Symeonidis does find changes in concentration in industries that were required to eliminate their agreements that were significantly greater than in other industries. This alone provides support for his contention that the agreements did restrict certain kinds of competition.

Symeonidis gives long detailed descriptions of, and justifications for, the variables he chooses to use in his empirical analyses. These do not always make for scintillating reading, but they are refreshingly honest and allow for a fair and complete appraisal of his findings. They also provide an excellent example of how an empirical researcher can grapple with complex issues arising from economic theory, econometrics, and specific historic events and make choices that allow one to draw useful conclusions about both history and theory, despite all.

The question that arises is whether collusion is bad or it only depends on the market outcome from the point of view on economic efficiency.

Oligopoly theory tells us that there are several ways in which firms behave in an oligopolistic environment as discussed in 2.3 above.

2.5 Market Regulation Policies

2.5.1 Competition Policy

Following the UNCTAD (1997), "competition" refers to the process of rivalry among firms and to market structures conducive to such rivalry or potential rivalry. Competitive rivalry may take place in terms of price, quantity, service, or combinations of these and other factors that customers may value (World Bank and OECD Study, 1998).

Symeonidis (2003) explains the main objective of competition policy as the tool to improve market efficiency by promoting or safeguarding competition between firms, and thus to minimise the resource misallocation effects of the exercise of market power. Economists usually distinguish between competition policy and regulation – with the latter referring to more direct government intervention in circumstances where effective competition is difficult or impossible because firms possess a lot of market power and are likely to abuse it.

High market concentration has traditionally been seen as a cause of concern, since it has been thought to facilitate the abuse of market power by firms. However, higher concentration need not be associated with less price competition and lower welfare. The opposite may sometimes be the case, as more intense competition reduces profit margins and the number of firms that can survive in an industry. So competition authorities should probably be less concerned with concentration than with ensuring that competition between firms is "effective", example, firms do not collude or otherwise abuse their market power and there are no barriers to entry.

2.5.2 Design and implementation of competition policy

There are several difficulties with the design and implementation of competition policy raised by the World Bank and OECD Study, (1998):

- Firm conduct, which may improve one aspect of market efficiency, may also worsen another. For example, a horizontal merger between two firms may result in higher prices, but it may also lead to lower current costs or lower future costs or better products.
- In many cases, the effect of a particular business practice on efficiency may not be unambiguous in general. Examples of such practices are price discrimination, exclusive dealing agreements between manufacturers and retailers, among others.
- Some practices, such as tacit collusion or predatory pricing, are difficult to detect, thus making the implementation of policy difficult even in cases where the welfare implications of firm conduct are relatively unambiguous.
- It is not always easy to know what degree of market power is acceptable in a particular industry, given the technological and other constraints faced by firms in the industry. Some degree of market power is necessary under conditions of increasing returns to scale, so that firms can cover their fixed costs, including investment and research costs. Moreover, a firm may possess market power because it is efficient or innovative, which surely cannot be bad in itself.
- Assessing the market power of firms (or the change in market power which has been or may be brought about by a certain action of the firms) may be complicated because of difficulties in defining the relevant product or geographical market, the absence of precise information on firms' costs

and perhaps also on demand parameters, and the need to take into account market dynamics that may influence the extent to which market power is likely to persist in time.

- The efficiency goal has not been the only objective of competition policy in practice. Other objectives may include the protection of small firms, the dispersion of economic power, and the maximization of consumer welfare (as opposed to efficiency).

- Conflicts may also arise between competition policy and other government policies, such as industrial or trade policy. For instance, competition policy may clash with a policy of supporting the creation of strong domestic firms that are able to compete with foreign firms in some sectors.

2.5.3 Merger policy

Competition authorities can influence market structure in particular industries by preventing certain mergers between firms from taking place as World Bank and OECD Study, (1998) pointed out. The rationale for merger policy is that a consequence of many mergers is the creation of significant additional market power. In the case of horizontal mergers, the primary concern is the rise in market share. In the case of vertical mergers, the primary concern is the possibility that vertical integration hinders the access of non-integrated firms to outlets or sources of supply.

Even when a merger creates significant market power, it can have countervailing benefits, such as current or future efficiency gains. The merger may therefore be allowed despite its effect on competition. This can be justified if the merger is thought to result in lower costs, better management, improved R&D capabilities, or some other efficiency gain. Moreover, mergers may often be made necessary by exogenous changes

in market conditions such as competitive pressures due to economic integration. A merger may be allowed if it can be shown that one of the firms will otherwise go out of business.

2.5.4 Policy toward restrictive practices

Explicit or tacit agreements between firms to fix prices or to allocate customers or geographical areas are generally considered as detrimental for competition and are therefore prohibited in most competition laws. There are some exceptions, the most important of which concerns agreements to cooperate in research. The major difficulty regarding horizontal restrictive practices is detection. It is not easy to distinguish between collusive and non-collusive behaviour on the basis of the information typically available to competition authorities. For instance, parallel pricing, that is the similarity of prices and price changes, is not sufficient for concluding that collusion exists. The exchange of information on prices, costs etcetera between firms may facilitate collusion, but it may also improve the knowledge of market conditions and thus promote competition.

2.5.5 Policy toward the abuse of a dominant position

Competition authorities are not so much worried by the mere existence of market power as by the possibility that market power is used in a way that eliminates, restricts or distorts competition. Business practices that may constitute abuses of market power include 'excessive' prices, strategies that deter entry or expansion of rivals, price discrimination, tying, predatory pricing, and vertical restraints. Some of these practices, such as price discrimination or vertical restraints, can have ambiguous welfare effects. Others, such as introducing new products or building capacity in anticipation of a rise in demand, can be legitimate competitive actions

even if they also deter entry. And still others, such as predatory pricing, are definitely welfare reducing, but are also difficult to detect. Most competition laws therefore recognise the need for detailed investigations on a case-by-case basis when it comes to assessing whether a firm or group of firms have abused their market power.

Competition forces firms to become efficient and to sell a wider range of goods and services at lower prices. The World Bank and OECD Study (1998) noted that in a competitive economy, price and profit signals tend to be free of distortions and create incentives for firms to reallocate resources from lower to higher-valued uses. Decentralized decision making by firms promotes efficient allocation of society's resources, increases consumer welfare, and gives rise to dynamic efficiency in the form of innovation, technological change, and economic progress.

Firms, however, can have the incentive to obtain market power, for example, the discretionary control over prices and other related factors determining business transactions. Market power refers to the ability of firms, unilaterally or in collusion with others, to profitably raise price and maintain it over a significant period of time without competitive response by other existing and/or potential firms (Khemani, 1993). Firms have market power individually or collectively when buyers do not have enough choice of alternative independent sellers. In a competitive market economy, consumers may buy from any firm and firms in general, can enter any market. There can never be market power when entry is easy. As soon as one firm or a group of firms attempts to increase prices or lower quality from competitive levels, a new firm can come in to serve the market. Firms may gain market power by limiting competition, for example, by erecting barriers to trade, entering into collusive arrangements to restrict prices and output, and engaging in other anticompetitive business practices.

Barriers to entry are necessary for market power. Market power can be created through mergers or agreements between competitors not to compete or through restrictive vertical arrangements and predatory pricing which is an abuse of pre-existing market power. A firm's exercise of market power can harm consumers and other producers through higher prices (rather than competitive prices), reduced output, and poorer quality products. In general, the above examples of imperfect competition are viewed as market failures that result in inefficient allocation of resources and negatively affect industry performance and economic welfare. These market failures enable firms to deliberately reduce output in order to extract higher prices at the expense of consumers and society in general (World Bank and OECD Study, 1998).

Barriers to entry can be categorized as either structural or behavioural. Behavioural barriers represent abuse of dominant position where "relatively large" firms engage in anticompetitive conduct by preventing entry or forcing exit of competitors through various kinds of monopolistic conduct including predatory pricing, market foreclosure.

Behavioural restraints are classified into two: horizontal and vertical restraints. The former refer to agreements that are often referred to as "naked" restraints of trade, cartel behaviour, or collusion. Examples are price-fixing, bid rigging, and allocation of territories or customers, and output restriction agreements. Vertical restraints are contractual agreements between supplier and purchasers/retailers in both upstream and downstream markets.

Examples include:

- Resale price maintenance agreements: the producer or price floors fix retail price or ceilings are imposed

- Exclusive distribution agreements: distributors are assigned exclusivity within a geographic area or over particular types of clients, or over specific products
- Exclusive dealing agreements: downstream firms are prohibited from dealing with competing producers or distributors
- Tie-in sale agreements: downstream firms are required to purchase a certain range of products before being allowed to purchase a particular product
- Quantity forcing: downstream firms are required to purchase a minimum quantity of a product.

2.6 Theories of Competition

There are a number of theories in industrial organization economics explaining the need to preserve competition (Aldaba, 2000). The two major opposing schools of thought can be broadly classified into two: structuralist school as developed by Joe Bain and contemporaries market efficiency model or Chicago school which is attributed to Stigler and Demsetz.

2.6.1 Structural and Behavioural Barriers to Entry

2.6.1.1 Structural

Regulatory barriers on entry imposed by government policies. They include

- Special permits, license to operate
- Regulations influencing the use of some inputs
- Tariffs, quotas, and other non-tariff barriers

- Anti-dumping and countervailing duties
- Discriminatory export practices
- Exclusionary lists
- Ownership restrictions

Other barriers

- Sunk costs: costs that a firm cannot avoid by withdrawing from the market, sort of entry fee
- Absolute cost advantage: access to natural resource or human resources
- Economies of scale: unit cost of production falls with increasing output
- Large capital requirements
- Network industries: firms that are competitors share some critical facility like transportation and telecommunications

2.6.1.2 Behavioural

- Limit pricing: pricing by an incumbent firm of pricing so low that given the economies of scale in a market, there would be no room for an entrant if it believed the incumbent would maintain its pre entry level of output after entry
- Predatory pricing: practice of a dominant firm selling its products at prices so low as to drive competitors out of a market, prevent new entry, and successfully monopolize the market
- Excess capacity
- Product differentiation and advertising

- Horizontal restraints: collusion (price-fixing agreements, market sharing territorial arrangements, bid rigging), price discrimination
- Vertical restraints: resale price maintenance, exclusive dealing
- Foreclosure and exclusion
- Tactics to increase rivals' costs
- Contracts

While both schools share the same objective, that is to promote the efficient use of resources, the debate stems from the choice and application of different policy instruments.

The structural theory of market performance states that firms respond to entry but are able to earn persistent profits when the structural characteristics of markets make entry difficult. Bain identified the conditions of entry as technological features of markets that affect the exercise of market power. Economies of scale, absolute cost advantages, and product differentiation were the primary determinants identified as entry barriers that enable a firm to maintain price above average cost (Gilbert, 1973).

The structuralist school emphasizes the interaction between market structure and collusive and exclusionary business practices by firms that enable them to exercise market power and persistently earn excess profits (Khemani and Dutz, 1993). The structuralist school is rooted on the traditional structure-conduct-performance (SCP) paradigm of industrial concentration which states that a concentrated industry (structure) will facilitate collusion (conduct) and hence monopoly pricing (performance).

Firms operating in oligopolistic industries with large market shares are more likely to coordinate their pricing and output or to unilaterally engage in anticompetitive behaviour. Khemani and Dutz (1993) noted that in the past the emphasis was on the role of market structure, but today, the focus is more on pricing and output policies affecting market structure while aiming at excluding competition such as advertising, research and development, contractual arrangements, and pre-emption of input sources and distribution channels.

The Chicago school was developed in reaction to the structuralist viewpoint that industrial concentration fosters collusion and hence, monopoly pricing. Demsetz (1973) argued that superior low cost firms would have higher profits and would grow to dominate their industries. Low costs lead to competition, which in turn lead to concentration of industry (Leach, 1997). Advocates of the Chicago school say that a policy of industrial de-concentration would destroy efficiency with no benefit of lower prices to consumers.

Economists associated with the Chicago school maintain that markets are workably competitive and the market structure reflects differential efficiency, not strategic behaviour.

They argue that collusion is difficult to practice profitably in all but the most highly concentrated industries and is therefore not a serious problem (Stigler, 1968). Where competition is limited, collusion is primarily due to barriers to entry created by the government. They advocate the pursuit of economic efficiency as the unequivocal goal for competition policy. Failure to consider economic efficiency distorts the basic intent of competition policy. As a result, they favour a minimalist approach toward the implementation of competition policy.

Competition law, in particular, should be restricted to preventing collusion, especially price fixing agreements (Bork 1978 and Posner 1969 as cited in Khemani and Dutz, 1993).

The two schools of thought also differ with respect to the interpretation of the positive relationship between concentration and profits found in empirical studies. The structuralist school maintains that the positive relationship between concentration and profits indicates monopolistic pricing. High levels of concentration are due to anticompetitive business practices that lead to resource misallocation.

The Chicago school argues that the positive relationship reflects superior competitive performance by leading firms (with large market shares), independently of any ability to collude (Leach, 1997). In the absence of government-erected barriers to entry, high levels of concentration and profits can be maintained only if the leading firms constantly strive to be innovative and efficient (Khemani and Dutz, 1993).

CHAPTER 3: LITERATURE REVIEW

3.1 Introduction

In the previous chapter general cartel and competition theories were explored, this chapter will encompass these theories in an endeavour to understand the South African cement market, the competition laws that govern South Africa will also be exhausted. Only literature relevant to the South African cement industry is reviewed. However a variety of other cases in the South African context or industries will also be used in elaborating critical points for both competition and empowerment survey.

The cement production process is also discussed in this chapter so as to quantify and give full understanding of the production cost in terms of variable and fixed cost. The process description also assists in understanding the complexity of the production process, which elaborates the skills necessary to run the production process efficiently hence indirectly reduction in production cost, thus giving firms a competitive advantage. Further, the process description helps to understand the technology applied in the industry, which is relatively the same from firm to firm and the homogeneity of the product, this also sheds light in understanding how capital intense the cement operation is.

The chapter provides guidelines within which the South African competition is governed in terms of welfare considerations. This elaboration is then used in developing the context of Black Economic Empowerment application in this study.

The literature that is relevant to this study consists of different research fields. The purpose of this research is to establish the current competition in the industry as well as the sustainability of the new companies in the

industry. Therefore the purpose dictates that the literature concerning market review in the South African cement industry be explored. Economic growth or decline of the country, which determines the buying power of the country's citizens, will also be explored. Government policies that affect the operation of the industry such as the new mining charter and reconstruction and development program will also be looked at in terms of houses, dams and roads.

The cartel cases from the South African point of view will be reviewed so as to establish the trend within the South African market and how the Competition Commission deals with it.

South African cement industry mirrors her economic and political climate, and growth has been modest over the last ten years, showing an increase of only 3% between 1989 and 2000 (Sheath, 2001). Sheath further states that the industry pattern of growth and decline has been closely related to the economy in terms of gross domestic fixed investment, both in the private and public sector.

Other influences seen by Sheath in the industry are the disbanding of the cartel, Asian crisis and relatively new government.

3.2 The Cement Production Process

Cement is a mineral material which, when in fine powder form reacts with water to form a strong mass of low solubility, at the same time giving off small quantities of heat. These physical characteristics have led to the use of cement as a binder for inert material such as bricks and stone in the construction industry (Bianchi, 1999).

The manufacture of cement commenced in the 19th century by bricklayer

Aspdin of Leeds in England by burning powdered limestone and clay in his kitchen stove. This crude method laid the foundation for the cement industry that is currently producing 1.5 billion tons per year. It is claimed that cement is the second consumed substance after water. Cement is exceptionally fine – one kilogram of cement contains about 70 billion grains and can pass through a sieve capable of holding water (Agnello, 2003)

The South African cement industry is characterized by cement plants that vary in age from recently commissioned plants (3 years ago) to plants built in the early 1930's, all of which incorporate old and new technologies. All South African cement plants produce Portland cement and blended cement products such as CEM I, and more recently CEM II and CEM III products, which are also the most common manufactured cement products in South Africa. Portland cement is a fine, typically grey powder comprised of several compounds: dicalcium silicate, tricalcium silicate, tricalcium aluminate, and tetracalcium alumino-ferrite, with the addition of 2-5% calcium sulphate (gypsum).

Different types of Portland cements can be created depending on the application, as well as the chemical and physical properties desired.

The exacting nature of Portland cement manufacture requires some 80 separate and continuous operations, the use of large-scale heavy machinery and equipment, and large amounts of heat and energy (between 20-25% of output costs are attributed to energy consumption). Large volumes of fossil fuels (in solid and liquid form) are required to maintain high combustion levels in kilns – for every 100 tons of clinker produced, approximately 15-16 tons of coal has to be burnt. Coal, hard coal, coke, pet coke and secondary fuels are used in this process. The capital investment per worker in the cement industry is among the highest

in all industries. All local cement producers have to comply with the European Norm Standards for cementitious products.

The nine stages of cement production at a Portland cement plant are:

- Quarrying / Raw material acquisition
- Raw milling
- Blending
- Calcining and clinkering
- Cooling of Portland cement clinker
- Storage of Portland cement clinker
- Finish milling
- Advanced blending
- Packing and loading

3.2.1. Quarrying / Raw material acquisition

The most common materials used are limestone, shells, and chalk or marl combined with shale, clay, slate or blast furnace slag, silica sand, iron ore and gypsum. In certain South African cement plants, low-grade limestone is the only raw material feedstock for clinker production. As calcium carbonate, usually limestone, is the predominant raw material, most plants are situated near a limestone quarry or receive this material from a source via inexpensive transportation (for an example the Ulco and Lime Acres plants are located within a major limestone belt). Plants try to minimize the transportation costs since almost half of the limestone is converted to CO₂ during the calcining process. The rock, which is in the form of lumps up to 1 m³ in size, is then crushed down to particles smaller than 19 mm. The crushed material is deposited on a blending bed that typically has a capacity of one week's supply. Quarry operations consist of drilling, blasting, excavating, loading, hauling, crushing, screening, Stockpiling, and storing. It is estimated that the quarrying process

contributes approximately 9% of the total production cost.

3.2.2. Raw milling

Raw milling involves grinding the extracted raw material into a fine powder so as to achieve the required particle-size for optimal fuel efficiency in the cement kiln and strength in the final concrete product. Three types of processes may be used: the dry, the wet, or the semi-dry technique. In South Africa all cement producers have switched to the dry-process. The raw materials are dried using impact dryers, drum dryers, air separators, or autogenous mills, before grinding, or in the grinding process itself. In the wet process, water is added during grinding. Once the 'fines' have been separated from the coarse particles, the fine material is transferred to a blending silo. The total grinding cost for both the raw mill and cement mill is 20% to 25%. This is due to electrical or power cost grinding media and liners wear and tear, which has to be replaced almost every year.

3.2.3. Blending

The mill feed proportions are changed every few hours, such that definite compositions are laid down in the blending silo. By correctly controlling the operation, the meal in the blending silo will have the correct average composition by the time the silo is full. The fine powder is then properly mixed to form a homogenous blend. This blended material is transferred to a storage silo, known as the kiln-feed silo.

3.2.4. Calcining and clinkering

In calcining, the raw mix is heated to produce Portland cement clinkers. Clinkers are hard, grey, spherical nodules with diameters ranging from 0.32–5.0 cm created from the chemical reactions between the raw

materials. The calcining system generally involves three steps: drying or preheating, calcining and burning (sintering). The clinkering process takes place in the burning/kiln section. The cylindrical steel rotary kiln is mounted with the axis inclined slightly from the horizontal and can be 3,5-4 meters wide, 110-120 meters long and rotates at 1 revolution per second. Short kilns are favored over long kilns due to improved energy efficiencies and heat distribution – long kilns (over 130 meters in length) are normally on standby during shut downs and maintenance.

Finely ground coal is burnt at one end of the kiln – the hot gases pass through the kiln and then upwards through a number of cyclones into an induced draught fan'. The cold kiln-feed/raw mix is dropped into the top of the preheater. Centrifugal forces throw the meal against the walls of the cyclones and the meal slides down by gravity into ducts below. The hot gases pick up the feed and sweep it into the next cyclone, once again exchanging heat. This semi-counter current heat exchanger significantly reduces total heat consumption in the burning process.

The temperature of the feed is between 900-1000°C as it enters the kiln. At this point, the compounds have split up into their individual constituents (CaO, Fe₂O₃, SiO₂, Al₂O₃) and chemical reactions take place. New compounds (calcium aluminosilicate and aluminosilicate) form as the material approaches the lower end of the kiln. Aluminosilicate clinker is formed at temperatures of 1450 -1500°C. The material leaving the burning zone is now called clinker. All South African clinker manufacturing processes use a rotary kiln and have a 'burning' stage and all or part of the pre-calcining and calcining stages. For a typical 4stage preheater-kiln, the overall heat consumption is about 4 MJ per kilogram of clinker. This process consumes a lot of combustion energy in terms of coal, and in terms of refractory, the cost incurred in this area alone is 15% to 20%.

3.2.5. Clinker cooling

The clinker cooling operation recovers 30-35% of kiln system heat, preserves the ideal product qualities, and enables the cooled clinker to be transported further by conveyors. The most common types of clinker coolers are the planetary and rotary cooler types. Air sent through the clinker to cool it is directed to the rotary kiln where it nourishes fuel combustion. The fairly coarse dust collected from clinker coolers is comprised of cement minerals and is restored to the operation. Based on the cooling efficiency and desired cooled temperature, the amount of air used in this cooling process is approximately 1,5 m³ per kg of clinker. Depending on the process, some plants have no cost in this area, however this is one area that determines partially the reactivity of the cement therefore companies have moved to the new technologies which cost approximately 0.5%.

3.2.6. Clinker storage

Although clinker storage capacity is based on the state of the market, a plant can normally store up to 25% of its annual clinker production capacity. However, in South Africa, at most, two weeks production is kept on site. Equipment such as conveyors and bucket elevators is used to transfer the clinkers from coolers to storage areas and to the finish mill. Gravity drops and transfer points typically are vented to dust collectors. Only investment cost are incurred at this stage, however wear and tear are incurred and therefore goes to the maintenance cost which eventually is transferred to the customer.

3.2.7. Finish milling

During the final stage of Portland cement production known as finish milling, the clinker is ground with other materials (which impart special characteristics to the finished product) into a fine powder. Up to 5% gypsum or natural anhydrite is added to regulate the setting time of the cement. Other chemicals which regulate flow properties or air entrainment, are also added at this point. Several plants use a roll crusher to achieve a preliminary size reduction of the clinker and gypsum. These materials are then sent through ball mills (rotating, horizontal steel cylinders containing steel alloy balls) that perform the remaining grinding. The grinding process occurs in a closed system with an air separator that divides the cement particles according to size. Material that has not been completely ground is sent through the system again. As previously said this is 20% to 25% of the production cost.

3.2.8. Advanced blending

Clinker was initially blended with fly ash and slag in the 'finish milling' stage. However, due to the varying coarse grades and hardness of the different constituents, these additives (that is extenders or fillers) have been separately milled and added in the post-production phase of clinker manufacturing. These finished products (CEM I, CEM II and CEM III) have a higher extender: clinker ratio, reduce kiln emissions CO₂ in particular and improve energy efficiency in the manufacturing process.

3.2.9. Packing and loading

Once the production of Portland cement is complete, the finished product is transferred using bucket elevators and conveyors to large, storage silos in the dispatching department. In 2002, all Portland cement was

transported in either bulk or bag form (which comprised 58% and 42% of total sales respectively). Two bags are currently used in the industry: the 3-ply paper bag and the more favored polypropylene woven bags. Once the cement leaves the plant, distribution terminals are often used as an intermediary holding location prior to customer distribution. The same types of conveyor systems used at the plant, are used to load cement at distribution terminals.

3.3 South African Industry Structure

3.3.1 Pre Cartel dissolution Ownership

Until the 30th September 1996, the South African cement industry had operated as an officially recognised cartel (since 1971). This arrangement, sanctioned by the Competition Board, had allowed South Africa's three main producers, Pretoria Portland Cement (PPC), Alpha formally known as Anglo-Alpha) and Blue Circle (a subsidiary of the Murray and Roberts Construction group) to form agreements on the fixing of prices, market share and to maximise supply efficiencies. A fourth producer, Natal Portland (NPC) was equally owned by each of the three main producers (Economics Division Standard Bank Group, 1997).

3.3.2 Pre Cartel Dissolution Market

The analysis carried out by Fourie and Smith in 1994 on structural, conduct and performance in the South African cement industry concluded that the cement price levels and trends were unacceptably high. Market power violation by setting prices above marginal cost, which resulted in misallocation of resources was one factor highlighted.

Fourie and Smith (1994) acknowledged that due to a lack of in-depth information regarding the industry, firms and plant data, it is not possible

to determine to what extent these higher price increases were the result of the cartel members abusing their market power and/or various cost factors peculiar to the cement industry. They therefore foresaw the possibility of costs peculiar to the cement industry that could have had a contributing effect on unacceptable cement price trends and the unacceptably high price levels of cement.

The research carried out by De Wet in 1987 regarding the cement market under price control, which was eventually released in 2001 after the restriction by the Cement Manufacturers' Association, highlights factors peculiar to the cement industry. Among these factors are depreciation as a fixed cost and transport by rail as a variable cost.

These factors need to be revisited to establish if they have positive or negative impact after the cartel dissolution. It is also these factors that could enhance price competition among the industry players.

Prior to the cartel ban in 1996 the cement manufactures were using the cement pricing formula called Twycross Pricing System (TPS). This system or formula was applied to determine price increase of cement from year to year. The TPS was used to calculate prices of cement at various factories and distribution points.

The article by H.F de Wet highlights that De Wet's research covers the period from roughly the mid-1970s to the mid-1980s. The research by Fourie and Smith covers the period after cement price control was lifted in 1982 up to the early 1990s.

From 1982 to 1986, although cement price control had been lifted, cement price adjustments were made under the supervision of the Price Controller (De Wet, 1987:74). In 1986 price collusion was banned in South Africa (Fourie & Smith, 1994:133). From 1986 to 1996, when the cement cartel was dissolved, cement price adjustments were made under the supervision of the Competition Board (Fourie & Smith, 1994:133).

The aforementioned instruments indicate lack of competition before the cartel dissolution of 1996. The article by de Wet also discusses in detail the variable and fixed cost peculiar to the cement industry. In conclusion after his in depth analysis, the analysis shows that additional depreciation costs and rail transport costs had a negative impact on cement price levels and cement price trends. He concludes that the responsibility for changes in these two costs lies with the Competitions Board and the South African Railways (SPOORNET) and not with the cement manufacturers. This argument is only valid for high prices in the cement industry but invalid to determine competition in the cement industry.

He elaborates that the additional depreciation deductions called for vast sums of money for expansion purposes. This, in turn, prompted unacceptably high cement price increases to create the necessary funds for capital expansion. With regard to railage as a variable input, it is the South African Railways that should be held accountable for cement price increases, through unacceptable high tariff increases enacted during the seventies and eighties.

Products- cement types prior to 1996 were mainly CEM II and I. These products are mainly basic forms of cement without any fillers or additives such as fly ash and slag. It is therefore clear that the market choice was limited prior to the dissolution of the cartel.

3.3.3 Post Cartel Industry Role Players

Three cement producers and one producer of gypsum and gypsum products dominate the South African cement industry. The big three are PPC, Alpha and Lafarge, which established dominance in the manufacture of cement and lime through a cartel. The estimated turnover of the entire industry is approximately R5.4 billion per annum. PPC describes itself as the market leader in South Africa. It was the dominant player in 1996 and is still the largest cement manufacturer locally, however following the

entrance of global giants Holcim, via Alpha, and Lafarge via Blue Circle in 1998, PPC can no longer presume to dominate. All of these producers are expanding their business into Africa. At many of the cement plants, a measure of upgrading in terms of bagging plants, packaging lines and grinding facilities was evident.

3.3.4 Ownership structure

The ownership structure in Table 3.1 reflects multinationals that invest in Euros and Dollars, therefore the return on investment are in dollars and Euros. From this it is therefore clear that the foreign exchange plays a pivotal role in the stability of the rand against foreign currencies is therefore important. The ownership reflects entry and exit, which reflects no barriers to entry or exit.

Cement Companies Ownership Structure

Company	Holding Company
PPC	100% PPC Company (Pty) Ltd (of which 68% is Barloworld owned)
Lafarge SA (Pty) Ltd	100% Lafarge SA (Pty) Ltd (part of Lafarge International)
Alpha (Pty) Ltd	54% Holcim, 46% Aveng
Natal Portland Cement	98% Cimentos de Portugal (Cimpor) 2% Employees Trust Fund
Ash Resources	50% Lafarge SA, 25% Alpha, 25% Roshoon (subsidiary of Eskom)
Slagment	33% Alpha, 33% Lafarge, 33% PPC Cement

Table 3.1 (Ashok, 2003)

Note the Ownership has changed: Alpha is now Holcim and own 100% Slagment.

3.3.5 Post Cartel Market Definition

A market has two components, its product and its geographic reach. The product market describes the good or service that is bought and sold while the geographic market describes the location of the producers or sellers of the product (Ashok, 2003).

- **Product Market**

There are currently a variety of cement types in the market. These are

- CEM I
- CEM IIA
- CEM IIB
- CEM III
- CEM V
- Masonry MC 12.5
- Masonry MC 22.5X
- GGBS (Slag),
- Fly ash

See appendix II for consumption of each product.

The industry has seen new products in the market due to increasing pressure imposed by the blenders. One cement producer launched a product CEM IIB so as to compete with the blenders, which were taking a significant market share in the blended cement segment. The strategy was to make this cement cost exactly like the lower strength cement blenders produce. Other producers were expected to do the same, however non-happened for over two to three years.

3.3.6 Post Cartel Market Perceptions

Lourens (2002) highlighted that cement users are unhappy about plans by the three major producers to increase prices sharply in the following years. The allegations that the legalised pricing and transport cartel, which was abandoned in 1996, was still in place were more prevalent. This statement is an indication that there are still suspicions and perceptions in the market that the cartel is still subtle continuing.

In response to this statement, the producers - Alpha Cement, Lafarge SA

and Pretoria Portland Cement - claim that the increases are in line with the rise in input costs following the decline in the rand's value.

Gomersall (2002), chief executive of PPC, said 45% of input costs are directly or indirectly related to the rand exchange rate and that 25% of the selling price is dictated by transport, of which about 85% is exchange-rate affected. In addition, 40% of the cost of a new cement plant would be related to the rand/dollar ratio. In this statement it is clear therefore that the consumers are paying in advance for the capital required to contract a new plant. The question is "Is this justifiable?"

Gomersall (2002) further said that most PPC cement plants are about 30 to 35 years old and will have to be replaced from about 2005 at a cost of between R1-billion and R2-billion, which is true for the other producers as well.

A sales manager for Concor Technicrete said although the three producers claim the cartel no longer exists and that prices rises are always within 1% - 2% of each other.

The three producers adopt different strategies of price increases, Alpha increases frequently whereas PPC is three times a year and Lafarge is twice a year. As a result, there is a spread of price increases, but relatively equal on yearly average.

In the past six to seven years advertising of cement has gone up. The companies have started advertising in all media of communications, television, radio, newspapers and radio. This is somewhat seen as a way of gaining competitive advantage.

3.3.7 The Asian Crisis

In 1998 due to the Asian crisis, the government took measures to protect its foreign currency. In the second quarter interest rates rose from 18% to

more than 25%; within two to three months (Sheath, 2001). The impact of this rise was experienced throughout 1999 and is still being felt today, although interest rates have returned to below the level of two years. Growth was therefore prohibited in the cement industry thus competition was retarded.

3.4 Industry Performance

The main years that will be reviewed are 2001 and 2002 since these years were critical in terms of interest rate and rand-dollar exchange rate. It is also within these years where main construction contracts were launched. The other years since 1996 to 2004 were considered in the survey and results are presented and discussed in chapter 6 and 7 respectively.

3.4.1 Civil Engineering

The civil engineering sector showed some improvement over the past year as the recovery of the industry continues. Turnover increased sharply in real terms (nearly 18%), although this was off a very low base.

The spending of the additional R8 billion (over a three-year period) on infrastructure developments, which was a feature of last year's (2001) budget, has started very slowly, but it is expected that this will accelerate over the next two years (Cement & Concrete Review, 2002).

Extensive expansion work in the mining industry, particularly platinum mines, had a very positive effect on the civil sector as well as work on such projects as Baviaanspoort Sewage Works, Injaka Dam, Mohale Dam (part of the Lesotho Highlands Water scheme) and Maguga Dam in Swaziland. Major contractors continued focusing on across-the-border activity throughout the year, to ensure better utilization of their resources (Cement & Concrete Review, 2002).

Confidence levels in the industry, which have always been a reliable leading indicator, turned very much more towards the positive in the second half of 2001. Therefore the civil engineering industry is likely to stimulate growth in the cement industry thus prices favoring the end user.

3.4.2 Building

Improved business conditions prevailed in the building industry during 2001, particularly in the residential sector. A significant contributing factor was that the mortgage rates showed a declining trend for most of the year, and stimulated the effective demand for residential properties.

In terms of the government's housing program however, investment activity has slowed down.

The non-residential sector was not so active following a surge in completions of office buildings and casinos during 2000 and early 2001. However, some large building projects were under in the year before that, notably the new Dimension Data Head Office complex, Melrose Arch, Cape Town International Convention Centre, Johannesburg International Airport extension and the third phase of Vodaworld.

The significant drop in the number of cancelled or postponed projects can illustrate the overall improvement in the state of the building sector. In 1999 more than 40% of building projects fell into this category whilst in 2001 this had eased considerably to approximately 13% (Cement & Concrete Review, 2002).

3.4.3 Cement Demand

Demand for cementitious materials in 2001 grew by 1,9% compared to the year before that. This fell well short of original predictions of a 3,5% growth, but at least the final performance was in positive territory for the

first time since 1997 (Cement & Concrete Review, 2002).

The first six months of 2001 produced a healthy 7% increase in demand compared to 2000. When looking at the second half of 2001, demand was 2,6% lower than the same period in the previous year. However, the heavy rains in the early part of 2000 contributed significantly to the drop in construction activity, and this makes such comparisons very deceptive (Cement & Concrete Review: 2002).

3.4.4 Provincial analysis - growth in demand was positive in five of the nine provinces, and particularly so in Northern Cape, Mpumalanga and Gauteng. The Western Cape region, a strong performer in 2000, suffered a reduction in demand of almost 12%. This was primarily due to the excessive rains in the third quarter (Business Day, 2002).

3.4.5 Regional analysis - 'regional' demand for cement comprises sales in the neighboring states of Lesotho, Botswana, Namibia and Swaziland combined with those of South Africa. Good growth was experienced in both Namibia (+8%) and Botswana (+10%) (Cement & Concrete Review: 2002).

3.4.6 End use analysis - the 'end-use' data includes two buying groups, which are not strictly 'end-use', namely Resellers and Blenders. Resellers, who account for half of all cement sales, distribute the product to several end-use sectors, which include DIY, concrete product manufacturers, and small to medium-sized contractors (Cement & Concrete Review, 2002).

In view of the amount of cement purchased by this sector and the strategic importance it holds for the industry, this study will explore this sector in detail. The aim is to establish who is buying this cement and for what purpose it is being used.

Blenders, for the most part, are members of the Independent Cement Producers' Association (ICPA) who purchase cement from the clinker producers and then modify and extend this for resale as blended cementitious product. The exact destination of cementitious products sold by ICPA members is not known at this stage, although it is likely that their products are supplied to primarily contractors and resellers (Cement & Concrete Review, 2002). This study will further explore the functioning of the blenders since it directly affects the operation of the cement market.

3.4.7 Products – The Cement and Concrete Review further states that, an analysis of the different cementitious products sold last year reveals a continuing trend away from the 'ordinary portland cement' CEM I types to blended equivalents within the CEM II range. This is part of a planned process by the cement clinker producers to reduce the levels of 'greenhouse' gas emission per ton of cementitious material supplied. Apart from investments in improving the efficiency of the cement manufacturing process, these producers can achieve improvements in emissions by moving to cements blended with fly ash, limestone or slag.

3.4.8 Distribution – There has been virtually no change in the road/rail split during 2001 when compared to year 2000, with road transport holding a commanding position at 96% of the volume of cement shipped. Similarly, the ratio of bag to bulk sales in 2001 was virtually unchanged from that of the previous year (Cement & Concrete Review, 2002). Problems with rail transport experienced have forced the industry to use road transport, which is rather expensive and indirectly affects the final selling price. Therefore this is another issue that will be explored in this research, as it is another factor that determines the success or failure of the cement business.

3.4.9 Exports – The exportation of the cement products indicates a leveling off in demand over the last two years, despite the ever-weakening Rand exchange rate (Cement & Concrete Review, 2002). There is no quantifiable data in this regard. However the study will explore this area further since sustainability of some companies might be dependent to their export capacities.

3.5 Demand cases and Benchmark

Cement is a commodity whose demand is determined by the business cycles in the construction industry. If construction slows, a drop in cement prices will not help boost construction. On the other hand, if cement prices rise, there is no real impact on demand. That is, demand is inelastic to price.

Ashok (2003) elaborates that regional differences are quite high in terms of demand. Developed markets in Europe have been struggling to grow, while, in the other parts of the world, particularly in Asia and South America, countries with high economic growth have seen rising demands for cement. For example, Asia saw a 7% increase in the demand for cement during the last decade. Countries with high GDP and low growth are called mature markets while countries with low GDP, high growth and high consumption of cement are known as emerging markets. The per capita cement consumption also show huge differences between various regions. The North American and the European markets consume nearly four times as much cement per head when compared to Africa. Asia, the biggest market, currently consumes over 250 kilos per head, about 60% of the European average. Within a country there is a correlation between cement consumption per capita and GDP per capita. This relationship, however, is not linear, at higher GDP levels the amount of cement consumption begins to decline and flatten out. But even at higher levels of

GDP there are some markets, most notably the US, which has seen renewed growth in cement consumption.

3.6 Supply cases and Benchmark

Cement is a commodity produced using limestone. Since limestone is abundant in most regions of the world, cement is produced locally. Its production requires huge capital investment. The investment is written off after several decades. Most companies invest in a cement plant, which has limestone reserves and capacity to run for over 50 years (Ashok, 2003). Fixed costs in the industry are particularly high and significant relative to variable costs. Fixed costs generally account for more than 50 per cent of the overall production costs. The fixed costs are usually sunk costs. Once built, a cement plant can serve no other purpose. As fixed costs are high with respect to the variable costs, the break-even point is high. With automation, labour costs have decreased, but energy consumption is the most significant variable cost. Thus profits in the industry are sensitive to the level of utilization of the production capacity. Significant cash flows are generated only when production increases beyond the break-even point, which depends on the efficiency of the plant.

The second most important feature that affects supply is the transportation cost. In South Africa, average transportation and distribution costs account for almost 11% to 15% of the cement price (De Wet, 2003). As a result the sphere of sales is within the radius of 150 -300 km from the site of production. The cost of transportation is highest when it is by road, followed by rail and is cheapest by sea. The South African market unfortunately cannot be served by road.

When a buyer chooses between two cement producers, his/her decision is primarily based on price, with innovation accounting for little in the

competitive process. However, differentiation between producers exist in a number of areas:

- Homogeneity of quality – quality and the colour of cement should remain constant throughout the entire construction period
- Delivery lead-time.
- Technical assistance – to choose cement suited for specific construction purposes and
- Deliveries with greater flexibility. Service quality is the only way to influence buyers when price differences are minimal.

3.7 Competition in General

Ashok (2003) further elaborates on the Competition in the cement industry, it initially occurs at the local level due to high transportation costs. Competition cannot be based on price as price cuts are easily spotted because of the nature of the product, which is undifferentiated. Competition is hence based on head to head market confrontation focused on price rebates and sales volume, in order to expand market share. Any substantial price cut by a competitor results in a price war. Rivalry also occurs when firms want to enhance their respective competitive advantages on the basis of improved product quality or reduced production costs.

Due to high barriers of entry and high consolidation in the industry, competition occurs at multi-point and multi-market level. Historically, cement firms entered different local markets as a business expansion strategy, to take advantage of growing markets, and to hedge against local economic fluctuations.

High transportation costs make location an important factor in the pricing policy. The best location combines three advantages:

- The plant is set up in a quarry with large quantities of high quality and easily workable limestone
- The plant is close to large urban areas
- The plant is near a railway line or a river network allowing cement to be delivered to far away places. A cement plant located inland rarely sells outside 300 km radius, and would normally sell the bulk of its production within 150 to 200 km.

3.8 Government Policies

3.8.1 The New Mining Bill

The bill has been accepted by the mining industry with mixed feelings (Thomas, 2002). Thomas further elaborates by saying some of the foreign investors, who are profit driven, might pull out of the country, as the country is now perceived as a high-risk country. This could therefore retard any further investment in the mining sector till perceptions blow off. The bill then could cause the old cartel to resurface but unofficially till foreign investors gain enough confidence in the bill thus starting to implement marketing strategies that will eventually help the consumer.

3.8.2 CO₂ Emissions

Another policy that increases the risk for the industry is environmental concerns. Although environmental policy is, at this stage, not a major issue, expectations are that increased pressure will be put on cement companies to reduce the damage that they cause the environment. CO₂ is the green house gas that cause global warming. More capital investment is needed to meet low CO₂ emissions, this means more capital investment which eventually is passed onto the end user.

In cement plants, direct CO₂ emissions result from the following sources:

- Calcination of limestone in the raw materials
- Conventional fossil kiln fuels
- Alternative fossil-based kiln fuels (= fossil AFR, fossil wastes)
- Biomass kiln fuels (biomass wastes)
- Non-kiln fuels

3.8.3 Competition Regulation in South Africa

Economists believe that: the welfare of society is the greatest when the resources of society are allocated in the economy so that consumers are able to satisfy their wants as far as technological and physical constraints permit. In this way the wealth of a nation is maximized. The aim of competition policy should be to help bring about this result (Reekie, 1999).

The main goal of competition policy, from an economic point of view, should therefore be allocative efficiency. Scarce resources should be allocated in such a way that the returns to society are maximized. But competition policy cannot be removed from the realities of the economic environment and choices have to be made between different interest groups. Should lower prices to consumers be the overriding goal, or can competition policy be used to pursue other macro-economic goals such as full employment?

In the 1992 Department of Justice Horizontal Merger Guidelines (USA), it is stated clearly that the cornerstone of the antitrust laws is consumer welfare and economic efficiency. This is confirmed by Russell Pittman of the US Department of Justice (1994): "Our experience tells us that if consumers have plenty of choices in a particular situation, they can force the market to behave competitively: they can take their business to firms that offer the highest quality for the lowest price, and in so doing they

force businesses, if they want to survive and prosper, to keep their prices low, to keep their quality high, and to make technological improvements". This is the rationale behind the US antitrust laws. This is also the overriding goal of antitrust policy in the United States: Protection of small and medium-sized businesses, codes of fair competitive conduct, and macro-economic policies such as employment and anti-inflation measures, have no place in U.S. antitrust laws (Wood, 1996).

The situation in South Africa seems to be different. Although economic criteria are important, the focus is somewhat blurred by the inclusion of some other ancillary objectives. Hovenkamp (1985) argues that other 'competing values' could also be considered when looking at competition policy, for an example maximization of consumer wealth, protection of small businesses from larger competitors, protection of easy entry into business and concern about large accumulations of economic power. These should however be subject to the main goal, which is allocative efficiency.

In the purpose of the South African Act (section 2) a list of goals is given. Apart from efficiency and consumer choice, other goals of competition policy are:

- To promote employment and advance the social and economic welfare of South Africans;
- To expand opportunities for South African participation in world markets and recognizes the role of foreign competition in the Republic.
- To ensure that small and medium-sized enterprises have an equitable opportunity to participate in the economy; and
- To promote a greater spread of ownership, in particular to increase the ownership stakes of historically disadvantaged persons. (1998:12).

Some authors have criticized these aspects, for an example Reekie (1999) warned that, the task of the competition authorities is difficult. To add the above four criteria to their remit may make it impossible, there is no denying that tough political choices often have to be made between the varying objectives of the above criteria, however competition authorities should not have to make them. If they so attempt it merely dilutes the predictability of their decision or results in inappropriate lobbying by defendants or plaintiffs.

The chairman of the Competition Tribunal, David Lewis has addressed these conflicting goals. In a recent paper presented at a conference in Taipei, he argued that: "Our act specifies a range of objectives to be served by competition law, objectives like protection of SME's, promotion of employment and support for the growth of Black-owned enterprises". Some of these conflicting objectives are deeply embedded in the act (2000:3).

It is argued by the proponents of such an approach that the specific needs of a developing country justify the use of competition policy to attain macro-economic stability and growth.

Lewis shares this view: However, my own view is that this is inevitable particularly in a developing country where distributional and poverty problems loom large and where all social and economic policy, no less competition policy, is expected to contribute to the alleviation of these first order problems (Lewis, 2000:3).

Including a range of macro-economic goals in the realm of competition legislation is a practice not uncommon among developing nations. There is probably a strong argument that all government policies should be geared

towards stimulating economic growth in a developing country. The question is whether efficiency is being sacrificed for developmental goals.

In a recent article in the Harvard International Law Journal, Fox (2000:2) defends the inclusion of provisions to redress past discrimination against ethnic groupings in the legislation of South Africa and Indonesia. In the Indonesian case the specific provisions are included in the light of ethnic discrimination by the Chinese minority against the ethnic Indonesian majority. In the South African case, the law includes provisions to redress the discrimination as a result of decades of Apartheid. "The provisions allowing exemption from agreements that promote the competitiveness of firms owned or controlled by historically disadvantaged individuals and allowing consideration of a merger's effect on the competitiveness of historically disadvantaged individuals reflect a bold new approach. This is un-chartered territory, The South African competition law applies a limited measure of affirmative action". The difficult issue then becomes: "Can competition law work as a means of advancing equality without substantially undermining market goals and without capture by private interests?" (Fox, 2000:2). In the cases below, it will be shown how public interest issues were considered in conjunction with economic efficiency criteria.

In the oil industry, the access of new black empowerment companies to storage facilities was a major concern in the analysis of the proposed merger between Shell, BP and Caltex. In similar fashion, the 4000 potential job losses as a result of the proposed merger between Stanbic and Nedcor, was emphasized by the Competition Commission in their report. In the sugar industry (the proposed merger between Tongaat-Hulett and Transvaal Sugar), the public interest issues focused on potential job creation, the positive impact on the Mpumalanga region and the ability to compete in international markets. In the furniture industry

(Ellerines and JD Group), the parties argued that the provision of financial services to the 'unbanked' as a result of the merger would be in the public interest. This argument shows that precedence is being given to the social welfare at the expense of market efficiency.

3.9 Broad-Based Socio-Economic Empowerment Charter for the South African Mining Industry

3.9.1 Vision

All the actions and commitments set out below are in the pursuit of a shared vision of a globally competitive mining industry that draws on the human and financial resources of all South Africa's people and offers real benefits to all South Africans. The goal of the empowerment charter is to create an industry that will proudly reflect the promise of a non-racial South Africa.

3.9.2 Opening Statement

Recognising:

- The history of South Africa, which resulted in blacks, mining communities and women largely being excluded from participating in the mainstream of the economy, and the formal mining industry's stated intention to adopt a proactive strategy of change to foster and encourage black economic empowerment (BEE) and transformation at the tiers of ownership, management, skills development, employment equity, procurement and rural development;
- the imperative of redressing historical and social inequalities as stated by the Constitution of the Republic of South Africa, in inter alia section 9 on equality (and unfair discrimination) in the Bill of Rights.
- the policy objective stated in the Mineral and Petroleum Resources

Development Act to expand opportunities for historically disadvantaged persons to enter the mining and minerals industry or benefit from the exploitation of the nation's mineral resources.

- the scarcity of relevant skills has been identified as one of the barriers to entry into the mining sector by historically disadvantaged South Africans (HDSA's).
- the slow progress made with employment equity in the mining industry compared to other industries.

Noting that

- It is government's stated policy that whilst playing a facilitating role in the transformation of the ownership profile of the mining industry it will allow the market to play a key role in achieving this end and it is not the government's intention to nationalize the mining industry. The key objectives of the Mineral and Petroleum Resources Development Act and that of the Charter will be realized only when South Africa's mining industry succeeds in the international market place where it must seek a large part of its investment and where it overwhelmingly sells its product and when the socio-economic challenges facing the industry are addressed in a significant and meaningful way.

The transfer of ownership in the industry must take place in a transparent manner and for fair market value (Mining Charter, 2003)

This is just the extract of the mining charter, which is aimed at highlighting the context of the charter.

As of June 2004, only three Black Economic Empowerment sector charters have been released – in the oil and gas industry, the mining industry and the financial services industry. The information and communications technology (*ICT*) industry has issued drafts of its proposed ICT charter and there has also been some activity in the Property, Construction and Media,

Advertising and PR sectors. It is therefore clear that the charter is not going to go away and businesses, including the cement companies, can either respond to this as a business opportunity or a business threat. The future therefore lies with those that can adapt and change, this is not only to survive, but also to take advantage of the opportunities and thrive.

3.9.3 Black economic Empowerment Analysis

3.9.3.1 The market is changing

Statistics give us a hint as to the impact of BEE on the business market. It is estimated that there are 4 million economically active white people in South Africa, a figure dwarfed by 11 million economically active black people.

Traditionally, purchasing power was concentrated in the white market, but this market is no longer growing and may even be shrinking. Thus, competition for the same number of traditional households is stiff, while a huge emerging market with disposable income is positioned right next to it. It makes sound business sense to take note of these figures and re-position a business in line with the opportunities.

As the benefits of BEE filter through, more black people will be brought into the mainstream economy. It is further predicted that in a few years, the vast majority of people in LSM 7-10 will be black. This, without a doubt, should make any marketing person or business owner sit up and take notice (Fox, 2000).

3.9.3.2 Competitive advantage

How to approach such a new market? Complying with BEE legislation, even though it may not be required, is one way. A black partner in the

business could open up access to markets a traditional white company may not have access to otherwise. This new market will certainly prefer to be serviced in their own language and by a person they can identify with, so employment equity becomes a competitive advantage.

3.9.3.3The supply side of procurement

The traditional market will change, as companies in all sectors begin to look for ways to meet their procurement targets. Any company on the supply side of the economy can certainly position itself as, not only being providers of goods or services, but also being BEE providers of those goods and services that clients can add to their procurement points. It therefore makes business sense to have a black partner in a business chain, since the potential market will notice and the company's brand be well known. Gone are the days where people would purchase a product because they had no choice. People are beginning to understand the dynamics of the product, including cement. Building is a lifetime investment and therefore people are more careful in choosing what cement to buy.

South African competition legislation includes a range of macro-economic goals. Some economists warned that this might lead to inconsistencies in the application of competition policy. But, there is some consensus that developing countries should adopt policies, which suit their specific needs. Until the disempowered fully participate in the economy, the efficiency potential of the nation is not likely to be realized. Second, some goals are more important than efficiency. Achieving a more equitable distribution of opportunity may be such a goal. Surely a nation has the right to make this choice (Fox, 2000:14).

The inclusion of public interest issues and affirmative action goals are important attributes of the South African Competition Act. In the words of the chairperson of the Competition Tribunal: "I am pleased that the responsibility for these public interest matters has not been given to a minister but rather to a competition agency that must show ordinary citizens the relationship between an effective competition policy and the realization of their social goals" (Lewis, 2000:2).

It is clear in the context above that in South Africa one cannot dissociate competition policies from social welfare particularly black economic empowerment.

3.9.3.4 Cases of Fronting

Fronting is the use of previously disadvantaged individuals in the previously white owned companies either as directors or partners so as to get government contracts.

Over the two-year period the department awarded contracts to the value of R2, 5-billion, 75% or R1, 9-billion of which exceeded the R10-million threshold.

In 2003/04, of the R1, 3-billion contracts awarded (including contracts smaller in value than R10-million) 27% went to traditionally white-owned contractors; 31% to 'fronting enterprises'; 18% to genuine BEE companies; and 14% to non-respondents. In the 2004/05 period, when projects, including small contracts, to the tune of R1, 2-billion were placed by the department, 15% went the way of traditional contractors; 18% to fronters; 25% to true BEE enterprises and 43% to the non-respondents (Engineering News: 2005).

This investigation carried out by the department of public works indicates

how desperate companies are to gain competitive advantage by falsifying ownership.

3.10 Summary

In this chapter the cement process was discussed in order to understand the cost involved in the cement production process. It was established that the process is highly technical and needs highly skilled labour and high-energy consumption is incurred and therefore these two aspects could be used to justify high cement prices.

The industry structure was also looked at so as to establish any associations that could lead to collusive behaviour or conduct. The market trends were discussed in terms of civil and building engineering in order to establish cement demand trends, which could be another justification of high cement prices.

The competition regulation in South Africa was looked at and how the new mining bill affects competition as well as how the Competition Commission addresses issues of black economic empowerment.

CHAPTER 4: STATEMENT OF THE PROBLEM

4.1 Introduction

The political change in 1994 and the cartel dissolution in 1996 in the cement industry brought about new government policies moreover barriers to entry were both economically and politically lifted, thus allowing new multinationals to enter the cement market. It is from this understanding that the research problem, research aim and proposition as well a research questions are developed in this chapter.

4.2 Research Problem

Are the new international companies in the cement industry stimulating the market competition to the benefit of the consumer and absolutely terminating the cartel, which was once dominant in this industry? Will the new mining charter assist to stimulate competition in this sector or retard it to the disadvantage of the consumer? Or can competition law work as a means of advancing equality without substantially undermining market goals and without capture by private interests?

4.2 Research Aim

The research establishes the competitiveness in the cement industry, if it is helping to pull the prices down, thus benefiting projects such a RDP houses and other major but fundamental construction projects such as dams and roads. Simultaneously the research will act as a yardstick to measure the consequences of the new mining charter in the cement industry in terms of competition stimulation or retardation.

4.3 Research Questions

- To what extent has the cartel dissolution of September 1996 created competition within the cement industry to the benefit of the customer?
- To what extent has the new mining charter directly or indirectly stimulated the competition in the cement industry?

CHAPTER 5: RESEARCH DESIGN AND ANALYSIS

5.1 Introduction

In this chapter a full exposition of the research design and analysis is given. More particularly the analytical approach, sample design and collection as well as measuring instruments are dealt with.

5.2 Analytical Approach

Working within the parameters of the SCP paradigm, the first step would be to correctly define the market. Market definition is a vital step in any competition analysis. The purpose of market delineation is to permit calculation of market shares, which are then used to evaluate market power issues. The market definition will be divided into two parts, determining the relevant product and then the geographic market.

The method used in the USA will be applied in the analysis; this is the concept of a "small but significant and "non-transitory" price increase.

A market is defined as a product or group of products and a geographic area in which it is produced or sold such that a hypothetical profit-maximizing firm, not subject to price regulation, that was the only present and future producer or seller of those products in that area likely would impose at least a "small but significant non-transitory" increase in price. Assuming the terms of sale of all other products is held constant.

A relevant market is a group of products and a geographic area that is no bigger than necessary to satisfy this test (Theron, 2005).

The purpose of market definition is to calculate market shares and concentration indices.

5.3 The samples

In this study both the qualitative and quantitative methods of research are applied in investigating the research questions. In order to eliminate bias sampling the study was carried out in the provinces where all major cement producers operate. These provinces are North West, Gauteng, Mpumalanga and KwaZulu Natal. However it is also necessary to highlight provinces where monopoly is eminent for an example, Western Cape and Northern Cape.

Market share samples were obtained telephonically from major cement retailers within each province; the findings were then substantiated by company reports where available, particularly for the public companies. In cases of discrepancy in sampling, balancing to 100 per cent was done bearing in mind both field sampling and company reports. See questionnaire used on Appendix III.

Sources such as Cement and Concrete Institute (CNCI) were consulted to get provincial and national cement demand so as to substantiate field and company reports data.

Profitability in the industry was sought within literature and company publications; from this the industry average profitability was estimated. Moreover companies were approached for market share and general comments on profitability. The marginal cost was obtained from literature or publications. This was then substantiated by the basic cost calculations of the production process of cement.

Qualitative data such as black economic empowerment were obtained from companies themselves telephonically, however personal visits were also made to the companies where telephonical surveys failed. Cases

highlighting successes and failures of Black economic Empowerment were sought to establish the confidence level the cement industry could have in complying with the mining charter.

5.4 Quantification of variables

The measuring instruments applied in this study are obtained from market share and marginal cost figures respectively. To ensure reliability of market share, company publication were used, checked against the questionnaire results which retailers answered, further cement journals on company market share were also used in order to substantiate the questionnaire. See Appendix III.

The marginal cost results were mainly obtained from company publications. These were compared to the general production cost taking into account the cement manufacturing process from quarrying up to the cement storage at the silos.

5.4.1 CONCENTRATION

The number and size distribution of the firms in an industry or market, most commonly expressed in terms of a "concentration ratio," that is, the percentage of production or sales accounted for by some relatively small number of firms, generally the "four largest" and the "eight largest." The competitive significance of these ratios is said to lay in the proposition that they are correlated with price levels; the higher the concentration ratio, the further the price is expected to rise above the competitive floor and toward the monopoly ceiling. The mechanism, through which this is thought to be accomplished, is what is called "oligopolistic interdependence". In substance, as the number of firms decline and the size of their respective shares increases, the incentive to engage in price competition is lessened and their incentive (and capacity) to collude,

either expressly or tacitly, is increased.

Leach (1997) identified four measures of concentration using gross output as the size variable:

Four-firm concentration ratio (CR4) is the proportion of an industry's gross output accounted for by the four leading firms in the industry. It is the sum of the leading four firms' market shares.

The Herfindahl-Hirschman index (HHI) =
$$\sum_{i=1}^n ms_i^2$$
 Equation 5.1

Where ms_i is the market share of the i th firm and n the number of firms, that is the sum of the squared market shares of all firms in an industry. HHI ranges from a minimum of $1/n$ for n firms of equal size to a maximum of 1 when there is only one firm.

The HHI is the most common measure used to assess concentration from shares of industry participants. In the US, the following thresholds are used as guidelines:

0- 1000	unconcentrated
1000 -1800	moderately concentrated
Above 1800	highly concentrated.

The Horvath index (HI) =
$$ms_i + \sum_{j=2}^n ms_j^2 [1+(1-ms_i)]$$
 Equation 5.2

That is, the sum of the market share of the leading and a HHI of the remaining firms "reinforced by a multiplier reflecting the proportional size of the rest of the industry". The HI has a maximum of 1 and a minimum approaching ms_j .

$$\text{The Rosenbluth index (RI)} = \frac{1}{n \sum_{i=1}^{n-1} (i - ms_i) - 1} \quad \text{Equation 5.3}$$

Where n is the number of firms in an industry, i is firm rank, and ms_j is market share. Like the HHI, the Rosenbluth index ranges from a minimum of $1/n$ for n firms of equal size to a maximum of 1 when there is only one firm.

5.4.2 PROFITABILITY

The rate of return, the measure of how much is earned per capital investment, was once considered as the most appropriate gauge of performance. Other financial ratios of performance are ROA (the net profit after taxes per Rand of assets) and ROE (the net profits after taxes per Rand of equity capital) (Aldaba, 2000).

However, many studies have shown that accounting measures like the rate of return may fail to measure economic profits or costs accurately, especially when long lived capital assets are present. In transition economies, accounting profit is much more dubious measure of performance because of misreporting. To avoid these alternative measures have been developed (Aldaba, 2000).

Price-cost margins are commonly applied as measures of profitability in most concentration profits studies. The price-cost margin is defined as:

$(\text{Gross Output} - \text{Cost of Materials} - \text{Salaries and Wages}) / \text{Gross Output}$.

Leach (1997) considered the price-cost margin as a crude measure of profitability because many important costs remained in the measure such as cost of capital, depreciation, income taxes, and head office expenses like advertising and R&D expenditures.

In diagnosing market dominance, the price-cost margin or Lerner index:

$$L = [(\text{price} - \text{marginal cost}) / \text{price}] \quad \text{Equation 5.4}$$

is used as a direct measure of market power. Market power implies that a firm is able to charge prices substantially above than marginal cost.

A firm without market power must charge a price that approximates marginal cost. Marginal costs, however, are difficult to estimate from firm level data because:

- Accounting costs cannot be used to calculate the Lerner index and
- Mark-ups must reflect long-term costs. Mark-ups above operating costs do not reflect capital costs.

Researchers therefore use price-average variable cost margin instead of appropriate price – marginal cost margin. This approximation to the price average cost variable is calculated as sales revenues minus material cost divided by sales.

5.4.3 R –SQUARED (RSQ)

The relationship between concentration and profitability is estimated using regression techniques.

The R-squared value, also known as the coefficient of determination, is an indicator that ranges in value from 0 to 1 and can be interpreted as the proportion of the variance in y attributable to the variance in x. The correlation between concentration and profitability will then be determined by the RSQ. The RSQ of one denotes a strong the cartel existence, and therefore less competition.

CHAPTER 6: RESULTS

6.1 Introduction

The results below are presented in full cognizance of the research questions pointed out in chapter four, which are meant to establish if there is competition in the cement industry after the cartel dissolution of 1996, and further to establish if the mining charter directly or indirectly stimulates competition in the industry.

6.2 Relevant Product

The swing away from CEM II B cements to CEM V type cement is clearly illustrated in Table 6.1. This follows the introduction by one cement manufacturer a CEM V product late in 2003. There are additional sales of CEM V cements sold and used in the South African market, but these emanate from blending companies who, are not members of the Institute and do not participate in the data collection process. In order to protect confidentiality, therefore, the CEM V data reported has been combined with that of CEM III.

Cement Sales by Product

Sales of cementitious binders by product type (tons)						
Product Types	2000	2001	2002	2003	2004	% change 04 vs 03
CEM I	3,155,490	2,977,067	2,146,053	2,198,581	2,695,651	22.6
CEM IIA	2,522,163	2,714,994	3,605,715	4,341,624	5,315,878	22.4
CEM IIB	1,759,790	1,839,139	2,278,044	1,735,430	1,071,178	-38.3
CEM III/CEM V	483,261	488,212	494,416	697,796	1,214,726	74.1
Masonry MC 12.5	49,211	16,418	456	0	0	-
Masonry MC 22.5X	1,401	0	0	0	0	-
GGBS (Sleg)	372,652	495,645	901,777	585,760	670,535	14.5
Fly Ash	130,604	105,541	118,808	136,726	159,532	16.7
Other	516,658	528,166	478,419	467,253	608,500	30.2
Totals	8,991,430	9,165,184	9,623,688	10,163,170	11,736,000	15.5

Table 6.1 (CNCI, 2004)

6.3 Geographic Market

Cement has a limited shelf life (three to six months) and is characterized by high transport and handling costs. Cement manufacturing is resource based with cement plants located in or near limestone quarry areas. Cement firms use exclusive distributors to sell their products as depicted on Figure 6.1. Cement is distributed by road or rail from plant to depots and from depots to retailers finally end user (Ashok, 2004).

Table 6.2 shows the cement demand provincially against time in years; the growth or decline year on year basis is also depicted.

Provincial Cement Demand

Cementitious demand by end destination (tons)

Region	2000	2001	2002	2003	2004	% growth 04 vs 03
Limpopo Province	767,067	793,375	768,894	770,469	857,500	11.3
Mpumalanga	508,600	592,216	596,656	626,461	748,324	19.5
Gauteng	2,714,905	2,878,111	3,089,956	3,209,474	3,809,799	18.7
Free State	393,429	377,908	351,565	388,718	459,791	18.3
KwaZulu-Natal	1,214,147	1,192,671	1,270,449	1,440,235	1,617,193	12.3
Eastern Cape	492,280	470,223	507,500	731,008	938,651	28.4
North-West Province	590,152	615,908	714,472	695,760	723,380	4.0
Northern Cape	124,537	158,113	160,754	156,854	179,512	14.4
Western Cape	1,091,864	963,006	1,051,605	1,086,487	1,356,147	24.8
Domestic Total	7,896,961	8,039,231	8,511,851	9,105,466	10,690,265	17.4
Lesotho	199,355	170,740	148,999	126,094	111,427	-21.6
Botswana	482,715	498,195	530,176	539,239	531,285	-1.5
Namibia	267,829	280,265	272,796	254,251	267,275	5.1
Swaziland	174,550	166,656	159,867	138,120	135,748	-1.7
Regional Total	8,991,430	9,165,187	9,623,689	10,182,170	11,726,000	15.5

Table 6.2 "(CNCI, 2004)"

Geographical Location of Manufacturing Sites and Blending Station

South African Cement Industry Facilities

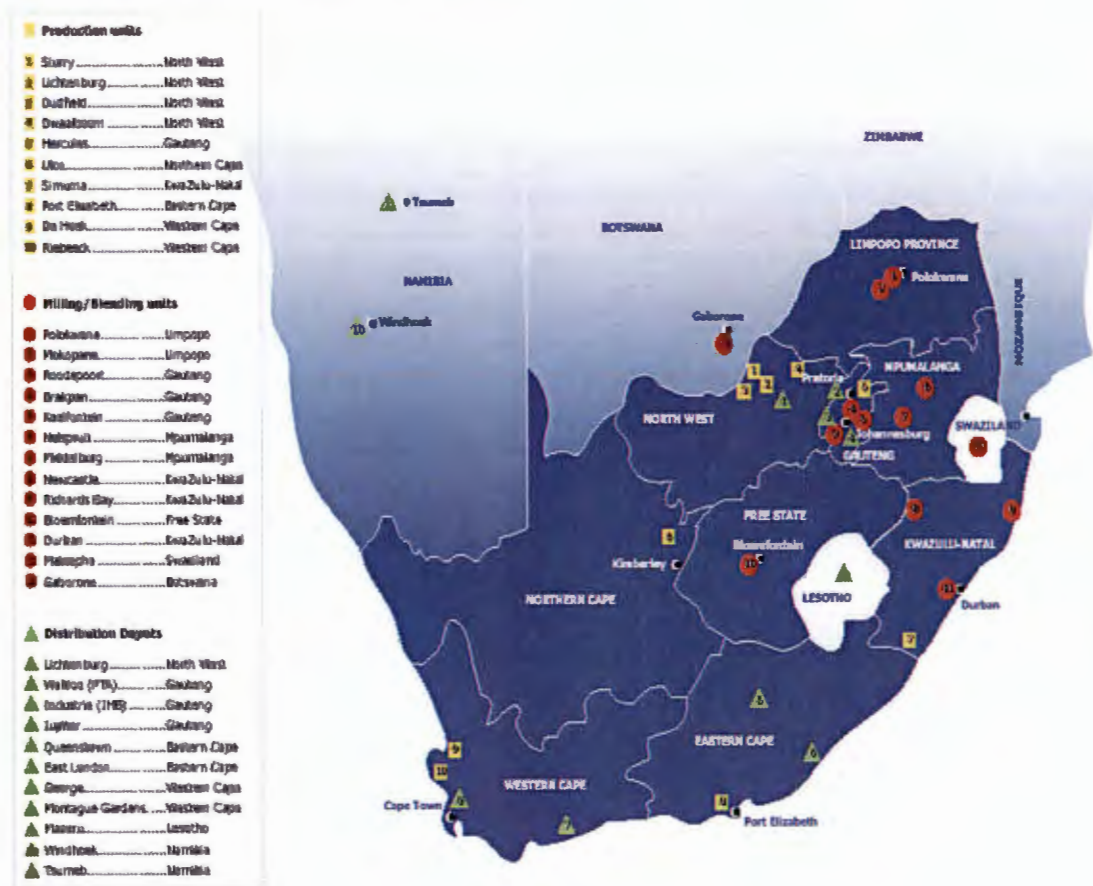


Figure 6.1“(CNCI, 2004)”

6.4 Survey Results Presented in Tables

Table 6.3 indicates the provincial and national market share from 1997 to 2004 per company. The market share obtained is then used to calculate concentration ratio (CR4) for the four major companies in the industry using equation 5.1. The results are depicted on Table 6.4. Further Table 6.4 depicts the Lerner index (Price - Margin Cost) obtained by applying equation 5.4. The correlation between concentration ratio and the Lerner index is then obtained by RSQ (R- Squared).

Table 6.5 depicts the cement price trends, demand, and capacity utilization so as to assist with the conduct analysis since companies restrict production (less capacity utilization) in a cartel operation.

Table 6.6 depicts perceptions in the South African industries regarding Black economic empowerment and impacts it has in the companies surveyed

Company Market Share in Percent

MARKET SHARE

GAUTENG								
Company	Year							
Name	1997	1998	1999	2000	2001	2002	2003	2004
Alpha/Holcim	33	34	32	33	31	32	33	33
BCC/Lafarge	29	27	29	27	28	29	29	28
PPC	38	39	39	40	41	39	38	39
NPC/Cimpor	0	0	0	0	0	0	0	0
TOTAL	100	100	100	100	100	100	100	100

NORTH WEST								
Company	Year							
Name	1997	1998	1999	2000	2001	2002	2003	2004
Alpha/Holcim	34	33	33	35	35	34	35	35
BCC/Lafarge	25	26	25	24	26	25	26	25
PPC	41	41	42	41	39	41	39	40
NPC/Cimpor	0	0	0	0	0	0	0	0
TOTAL	100	100	100	100	100	100	100	100

LIMPOPO								
Company	Year							
Name	1997	1998	1999	2000	2001	2002	2003	2004
Alpha/Holcim	21	22	21	23	22	21	22	23
BCC/Lafarge	20	20	21	22	19	20	18	18
PPC	59	58	58	55	59	59	60	59
NPC/Cimpor	0	0	0	0	0	0	0	0
TOTAL	100	100	100	100	100	100	100	100

KZN								
Company	Year							
Name	1997	1998	1999	2000	2001	2002	2003	2004
Alpha/Holcim	8	9	8	8	8	9	8	7
BCC/Lafarge	7	5	6	8	7	9	9	9
PPC	15	16	16	14	15	14	15	16
NPC/Cimpor	70	70	70	70	70	68	68	68
TOTAL	100	100	100	100	100	100	100	100

WESTERN CAPE								
Company	Year							
Name	1997	1998	1999	2000	2001	2002	2003	2004
Alpha/Holcim	11	10	11	11	10	10	11	11
BCC/Lafarge	0	0	0	0	0	1	1	0
PPC	89	90	89	89	90	89	88	89
NPC/Cimpor	0	0	0	0	0	0	0	0
TOTAL	100	100	100	100	100	100	100	100

MPUMALANGA								
Company	Year							
Name	1997	1998	1999	2000	2001	2002	2003	2004
Alpha/Holcim	33	32	32	32	33	32	32	32
BCC/Lafarge	30	30	30	30	29	30	30	30
PPC	37	35	36	38	36	37	34	36
NPC/Cimpor	0	3	2	0	2	1	4	2
TOTAL	100	100	100	100	100	100	100	100

NATIONAL								
Company	Year							
Name	1997	1998	1999	2000	2001	2002	2003	2004
Alpha/Holcim	23.3	23.3	22.8	23.7	23.2	23.0	23.5	23.5
BCC/Lafarge	18.5	18.0	18.5	18.5	18.2	19.0	18.8	18.3
PPC	46.5	46.5	46.7	46.2	46.7	46.5	45.7	46.5
NPC/Cimpor	11.7	12.2	12.0	11.7	12.0	11.5	12.0	11.7
TOTAL	100	100	100	100	100	100	100	100

Table 6.3 showing results calculated from the questionnaire.

National and Provincial Price Gaps, Concentration and Profitability
PRICE GAPS, CONCENTRATION AND PROFITABILITY

GAUTENG								
Commodity Cement								
INDICATOR	1997	1998	1999	2000	2001	2002	2003	2004
Price Diff.	2.00	1.00	4.00	5.40	2.00	1.00	4.00	5.00
Four Firm Conc.	33.74	34.06	33.86	34.18	34.26	33.86	33.74	33.94
Price-Cost Margins	0.33	0.43	0.45	0.54	0.69	0.70	0.70	0.68
CORRELATION: CONCENTRATION AND PRICE-COST MARGIN							0.18	
RSQ							0.03	

NORTH WEST								
Commodity Cement								
INDICATOR	1997	1998	1999	2000	2001	2002	2003	2004
Price Diff.	0.50	1.00	1.00	2.00	0.00	1.00	2.00	2.00
Four Firm Conc.	34.62	34.46	34.78	34.82	34.22	34.62	34.22	34.50
Price-Cost Margins	0.33	0.43	0.45	0.54	0.69	0.70	0.70	0.68
CORRELATION: CONCENTRATION AND PRICE-COST MARGIN							-0.50	
RSQ							0.25	

LIMPOPO								
Commodity Cement								
INDICATOR	1997	1998	1999	2000	2001	2002	2003	2004
Price Diff.	0.00	1.00	2.00	1.00	2.00	1.00	4.00	7.00
Four Firm Conc.	43.22	42.48	42.46	40.38	43.26	43.22	44.08	43.34
Price-Cost Margins	0.33	0.43	0.45	0.54	0.69	0.70	0.70	0.68
CORRELATION: CONCENTRATION AND PRICE-COST MARGIN							0.34	
RSQ							0.12	

KWAZULU NATAL								
Commodity Cement								
INDICATOR	1997	1998	1999	2000	2001	2002	2003	2004
Price Diff.	1.00	1.00	4.00	4.00	2.00	1.00	3.00	7.00
Four Firm Conc.	52.38	52.62	52.56	52.24	52.38	49.82	49.94	50.10
Price-Cost Margins	0.33	0.43	0.45	0.54	0.69	0.70	0.70	0.68
CORRELATION: CONCENTRATION AND PRICE-COST MARGIN							-0.74	
RSQ							0.55	

WESTERN CAPE								
Commodity Cement								
INDICATOR	1997	1998	1999	2000	2001	2002	2003	2004
Price Diff.	0.00	1.00	4.00	5.00	2.00	1.00	4.00	5.50
Four Firm Conc.	80.42	82.00	80.42	80.42	82.00	80.22	78.66	80.42
Price-Cost Margins	0.33	0.43	0.45	0.54	0.69	0.70	0.70	0.68
CORRELATION: CONCENTRATION AND PRICE-COST MARGIN							-0.26	
RSQ							0.07	

MPUMALANGA								
Commodity Cement								
INDICATOR	1997	1998	1999	2000	2001	2002	2003	2004
Price Diff.	1.00	1.00	3.00	3.00	2.00	1.00	3.00	5.00
Four Firm Conc.	33.58	31.58	32.24	33.68	32.30	32.94	30.96	32.24
Price-Cost Margins	0.33	0.43	0.45	0.54	0.69	0.70	0.70	0.68
CORRELATION: CONCENTRATION AND PRICE-COST MARGIN							-0.33	
RSQ							0.11	

NATIONAL								
Commodity Cement								
INDICATOR	1997	1998	1999	2000	2001	2002	2003	2004
Price Diff.	0.75	1.00	3.00	3.40	1.67	1.00	3.33	5.25
Four Firm Conc.	37.60	37.43	37.29	37.25	37.67	37.48	36.94	37.41
Price-Cost Margins	0.33	0.43	0.45	0.54	0.69	0.70	0.70	0.68
CORRELATION: CONCENTRATION AND PRICE-COST MARGIN							-0.22	
RSQ							0.05	

Table 6.4

Yearly Average Prices, Supply and Industry Capacity

AVERAGE PRICES, EXCESS SUPPLY AND INDUSTRY CAPACITY, 1997 - 2004

Indicators (tons)	1997	1998	1999	2000	2001	2002	2003	2004
Production Capacity	9375000	9500000	10000000	10625000	10625000	11250000	11250000	11875000
Exports	450000	420000	670000	390000	410000	600000	490000	290000
Imports	0	0	0	0	0	0	0	0
Potential Beginning Inventory		109558	998985	2054575	2338019	2800669	2138149	2279554
Total Domestic Supply (Potential)	9375000	9500000	10000000	10625000	10625000	11250000	11250000	11875000
Sales	8940442	8581015	7900425	7896981	8039331	8511851	9105446	10690265
Imports	0	0	0	0	0	0	0	0
Total Domestic Demand	8940442	8581015	7900425	7896981	8039331	8511851	9105446	10690265
Excess Supply	434558	918985	2099575	2728019	2585669	2738149	2144554	1184735
Average Price (R/t)	274	285	300	345	390	440	520	570
Capacity Utilisation Rate (%)	75	76	80	85	85	90	90	95
Percentage Changes	1997	1998	1999	2000	2001	2002	2003	2004
Production		1.3	5.3	6.3	0.0	5.9	0.0	5.6
Sales		-4.0	-7.9	0.0	1.8	5.9	7.0	17.4
Average Price		4.0	5.3	15.0	13.0	12.8	18.2	9.6
Total Supply		1.3	5.3	6.3	0.0	5.9	0.0	5.6
Total Demand		-4.0	-7.9	0.0	1.8	5.9	7.0	17.4
PED (PRICE ELASTICITY OF DEMAND)		-1.0	-1.5	0.0	0.1	0.5	0.4	1.8
PES (PRICE ELASTICITY OF SUPPLY)		0.3	1.0	0.4	0.0	0.5	0.0	0.6

Table 6.5

Black Economic Empowerment Table

Company Name	BEE Partner	Equity - %	Company Comments
ESKOM	ALSTOM -SA	17	Relative to its competitors, ALSTOM SA now has a market advantage in terms of its ability to pitch for major contracts. "We have a unique blend of shareholders, expertise and financial backing," says ALSTOM SA managing director Mark Wilson. "Above all our restructuring demonstrates our company's commitment to the upliftment of PDIs in terms of transferring technical and management skills within the organisation and participation at all levels in the development of the group. In addition, it is clear evidence of our long-term commitment to the development of the southern African region and economy as a whole." Besides strongly penetrating the South African market for infrastructural electrical equipment, systems and services in recent years through a combination of introducing advanced technologies, applying imaginative marketing programmes and expanding its operations through the acquisition of complementary businesses, the past few years has also witnessed a burgeoning of ALSTOM SA's business beyond South Africa's borders.
Proactive Insight	African response	Partnership	The unique combination of research experience, expertise, innovation, data collection and processing abilities, together with an integrated communication network will ensure additional evaluation and interpretation of results and packaging of the findings in an insightful and useful manner. It is envisaged that this newly formed alliance, power-packed with intellectual capital, will revitalise the already valuable SAARF offerings.
Fuelogic	Calulo Investment	38	According to Fuelogic's Managing Director Graham Searle, the contract of this magnitude is a boost to the company's business profile and to empowerment in general. Since receiving its first contract from TSA four years ago, Fuelogic has continued to demonstrate efficient levels of service delivery, hence the rewarding of the contract. Searle further lauds TSA for its genuine and consistent policies aimed at promoting black economic empowerment initiatives within the oil company.
Bateman	Many	51	This expertise, together with the fact that Bateman Africa is a majority BEE-owned company, the only BEE-owned process engineering house, puts it in a leading position to contend for future contracts in this sector. (Bateman, 2005)
ABB	Karebo Investments	20	Black Economic Empowerment (BEE) must incorporate comprehensive strategies, which are aimed at increasing access to productive assets, while ensuring the productivity of those assets. It should seek to promote new opportunities for, and increase the levels of participation, of black people in the ownership, management and control of economic activities. Strategies should support individual entrepreneurs as well as social and collective capital (ABB, 2005).

Table 6.6

CHAPTER 7: DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

7.1 Introduction

After the cartel official ban of 1996 in the cement industry, high expectations of intense competition and revolution of the industry were created. However new government policies formulated after the 1994 general elections particularly the Black Economic Empowerment (BEE) had to run concurrently with the cement industry new market evolution.

The results are discussed in terms of industry Structure, Conduct and Performance (SCP) in this chapter in order to draw conclusions pertaining the research questions. Recommendations are then made based on these conclusions.

7.2 Discussion

- **Structure**

Generally the industry has seen new international companies come in; Lafarge, Cimpor and Holcim, and the phasing out of Blue Circle, NPC and Alpha, which were part of the cartel pre 1996. These new players are renowned as world leaders in construction materials. The rich global experience they carry is one factor expected to reduce production cost and increase plant efficiency, which would benefit the end user.

The industry shed off joint ownership of some portfolios by selling them out to either company, Ash Resources to Lafarge, Slagment to Holcim and NPC to Cimpor. The industry restructuring is one way of trying to shed off the cartel image, which has been associated with the industry for

decades. It should be noted though that the South African Competitions Commission enforced this restructuring. The companies were compelled to make strategic decisions in buying or selling their shares in the above-mentioned portfolios. The potential collusion within the industry has dramatically reduced due to this restructuring.

The industry structure is further challenged by the mining charter (Black Economic Empowerment) policy, this policy assist in breaking barriers to entry thus de-concentrating the industry. Afripack is an example of what the industry has achieved in diversifying the ownership structure. This move therefore ensures that the market power of the companies is lessened thus less likely to collude.

- **Conduct**

The industry witnessed the introduction of new products as well as blended cements, which vary in performance.

The industry advertisement on the media catapulted to new highs in the past three years, which would not have been the case prior to 1996. Alpha and PPC are leading in this marketing strategy. Other companies highlighted that it would not make sense to advertise nationally whereas they are only regional or provincial role players. Moreover strong association is made with retailers, which market that particular companies brand to the end user. Therefore marketing is only necessary at the retailers

The market share of each province is directly linked to the geographical location of the manufacturing site and strategic milling/blending units of each company. In other provinces some companies do not participate or have minimal participation in the market, which is negligible for statistical

analysis. The companies locate strategic grinding station to reach their market, as it is easy and cheaper to transport clinker than cement. However some companies consign clinker purely due to lack of grinding efficiency at the manufacturing sites.

Some grinding stations are located close to the borders, for an example Polokwane and Richardsbay, for easy access to the imported clinker thus reducing the transport cost to the inland grinding stations. These stations are currently redundant since no cement imports are experienced in South Africa for now. However the owners tend to use them partially for production, like half-day operation. Companies strategically built most of these grinding stations after the cartel dissolution so as to gain competitive advantage.

There has been a concern though of tacit collusion in the industry, looking at the price difference of the products is not more than 7 Rands lately before 2004 it was even lower. The announcements made by the cement companies on price increase are usually successive of each other, known as price leadership in tacit collusion. Trade association still exists in the cement industry of South Africa, Cement and Concrete Industry where market trends are publicly dispersed. The companies also still make price insinuations publicly, which under tacit collusion would be an indication of prices direction from one company to the other.

Table 6.5 shows an increase in the plants utilization by the companies, however the increase in demand domestically as well as regionally is also observed. This therefore implies that the companies are not restricting production so as to increase cement prices. The utilization is only going up to meet the demand.

Since 1997 to 2004 the country never experienced imports and companies has excess capacity. The excess capacity acted as a barrier to entry either of imported cement or new companies investing in the cement market. 2004 however revealed elasticity in cement demand due to numerous projects on going in South Africa and the plant were already close to 100% utilization (95%). It would be interesting to monitor how the cement market responds to this challenge. Is there a chance of new plants getting constructed or new role players entering the market?

The conduct in terms of BEE (Black economic Empowerment) is not satisfactorily happening. Only Afripack has been outsourced to the previously disadvantaged. More could be done in the aggregates side where cement is prepared for construction purposes. These vertical partnerships will ensure that the cartel image the industry has is not restored.

- **Performance**

The performance in the industry in terms of profitability ranges from 33% 70% from 1997 to 2004. This is a high profit margin. De Wet (2003) pointed out that depreciation and railage are factors for the price hike in the industry.

The market share generally shows the dominance of PPC in the cement industry. In all provinces analysed except KZN, PPC shows dominance. This is due to its geographical location of the manufacturing plants, which reduces transport cost to the end user. In the Western Cape in particular PPC is the sole operator; other competitors are too far and would make it economically unviable to operate in this area. The Western Cape is therefore high in concentration ratio ~80%, followed by KwaZulu Natal ~50%, where Cimpor is the only manufacture in the province. However the Northern parts of this province are accessible to the competitor, which

stifles Cimpor absolute dominance.

Other provinces have low concentration ratios ~35% which shows that the market share is almost balanced. In the two provinces with high concentration ratios, a complete dominance cannot be claimed since there is always a potential for the other competitors to ship their products to these provinces. Therefore prices in these provinces follow national ones. There is little differentiation in terms of product price; therefore there is no competition in terms of prices. All other competitive factors such as quality of cement and service delivery both in after service and quality, customers seem happy for all the producers.

Nationally there is no correlation between concentration and profitability in the South African Cement Industry. The RSQ ranges from 0.03 to 0.55 provincially and 0.05 nationally. This indicates that there is no collusion in the cement industry. See Table 6.4.

The cement supply since 1997 has been higher than demand, however in 2004 supply and demand equated. The demand inelasticity was then tested as cement showed signs of elasticity for the first time in over six years. This poses the question of imported cements and expansions. At this stage imported cements cannot compete in the South African market mainly because it would be very expensive, besides companies operating in South Africa are multinational companies and would not compete against themselves.

- **Black Economic Empowerment**

The companies presented on Table 6.6 make positive statement in terms of black economic empowerment, in terms of reaching the broader market base and having a diverse labour that could be a competitive advantage.

7.3 Conclusions

In terms of the physical appearance of the industry, ownership, products and marketing strategy, it is clear that the industry has shed off its cartel image, joint ownerships have been dissolved; more products have reached the market and companies are now more vigorous in marketing themselves through advertisements.

The lack of positive relationship between profitability and concentration indicates that the collusion in the cement industry is non-existent. The question arises though, why is the profit margin in this industry so high? The railage in transporting raw material to manufacturing sites has been taken into consideration in the Lerner Index, this therefore can be ruled out as a factor from which exorbitant prices emanate.

Other studies highlight expansion plans, however this is disputed since on average only 85% of the total capacity has been utilized except 2004 where it catapulted to 95%. There are also no imports in the industry, which could justify high prices so as to increase capacity. However the cost of capital can justify why prices in this industry are so high. The investors in the industry are multinationals which make the Rand-Dollar exchange rate significant. Besides, the political transition in South Africa has put it as a high-risk area by the international community, thus high returns are expected from their investment.

However, PPC is the local company, with local shareholders who are not expecting dividends in dollars, the argument of Rand-Dollar exchange therefore do not hold water in this case. Clearly PPC prices in most cases are lower than Lafarge and Holcim but they should be far lower than they are at the moment, based on ownership, size and geographical location as compared to the other suppliers.

There could be no formal meetings among the cement producers to decide on prices but their behavior leaves a lot to be desired. However a different school of thought say the exchange of information on prices, costs, etcetera between firms may facilitate collusion, but it may also improve the knowledge of market conditions and thus promote competition. In South Africa, though no visible competition among the producers is observed. Therefore this school of thought does not hold any water, in the South African context.

The mining charter therefore would assist in addressing this issue. The capital will be both in Rands and in the hands of South Africans who understand the risks and therefore less expensive capital. The comments expressed on Table 6.5 by companies indicate that black economic empowerment is the competitive advantage, in bidding for major government contracts. These companies also realize the need to transfer the skills necessary so as to improve productivity and business management. The company profile is also enhanced through BEE. It is clear therefore that Black economic empowerment in the South African context directly affects competition. Cases of fronting bears testimony to this as companies falsely use blacks as directors and partners in order to get government contracts. The finding below highlights if the cement industry is taking advantage of this policy.

All producers though have not embraced the mining charter, in terms of giving previously disadvantaged individuals ownership. The only true ownership in black hands is Afripack Packaging realized in August 2004. This is seen as the testing ground for black owners in the cement industry. The companies generally showed willingness to embrace BEE, however only small operations such as aggregates are being considered for black hands. The BEE is still not fully fledged in the cement industry though, as said the Afripack deal could be seen as the testing ground and

more would follow after its success despite success shown by the listed companies on other sectors. Another point of view would be that the cement industry is stalling the process to have market power and dominance allowing easier collusion. However this is generally a highly technical operation, which requires skilled labor, of which previously disadvantaged South Africans, do not have. This then would stall the process of transformation. This will then prolong foreign capital investment thus high returns as previously pointed out.

Empirically, Symeonidis (2005) found that there is a simple correlation between industry concentration and the existence of a collusive agreement in the industry. But he argues that capital intensity is what actually increases the likelihood of collusion and that once capital intensity is controlled. The apparent correlation between industry concentration and the propensity to collude disappears. Black Economic Empowerment could therefore be a vehicle that alleviates capital intensity burden carried by the multinationals and therefore assurance that collusion disappears completely in the South African cement industry.

7.4 Recommendations

A thorough investigation by the Competition Commission must be carried out to establish if there is any tacit collusion within the South African cement industry. The government has already showed sentiments of concern since; the targets set for RDP houses are not met due to exorbitant prices of cement.

The Black Economic Empowerment policies need to be fiercely enforced by the government since they are assisting in fully disbanding the cartel image of the industry and would also ensure less market power of the companies resulting in better competition that would benefit the consumers.

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Appendix I

TABLE 8: SALES HISTORY BY END DESTINATION, DOMESTIC AND REGIONAL, 1997 – 2002 (Volume in tons)

Province	1997	1998	1999	2000	2001	2002	% Change 02 vs 01
Limpopo	802 675	805 225	734 574	767 067	793 375	778 686	-1.85
Mpumalanga	669 381	672 807	592 221	508 600	592 216	586 750	-0.92
Gauteng	2 834 984	2 596 068	2 587 386	2 714 905	2 878 111	3 090 429	7.38
Free State	544 646	422 576	449 289	389 161	377 508	351 565	-8.87
KwaZulu-Natal	1 502 285	1 397 367	1 294 471	1 214 147	1 192 871	1 270 449	6.50
Eastern Cape	536 778	501 209	501 662	492 280	470 223	507 512	7.93
North West	621 196	805 473	576 080	594 419	615 908	714 586	16.02
Northern Cape	182 714	194 552	150 094	122 738	156 113	160 754	2.97
Western Cape	1 245 783	1 185 738	1 014 648	1 093 664	963 006	1 051 593	9.20
TOTAL DOMESTIC	8 940 442	8 581 015	7 900 425	7 896 961	8 039 331	8 512 324	5.88
Lesotho	101 276	146 839	170 112	199 355	170 740	148 999	-12.73
Botswana	343 847	437 519	539 885	452 715	498 195	530 284	6.44
Namibia	243 662	228 822	232 040	267 829	290 265	272 796	-6.02
Swaziland	167 654	187 285	165 137	174 550	166 656	159 867	-4.07
TOTAL REGIONAL	9 796 891	9 581 480	9 007 599	8 991 430	9 165 187	9 624 270	5.01

Data Source: CNCI

TABLE 9: SALES HISTORY BY PRODUCT TYPE, 1999 – 2002 (Volume in tons)

PRODUCT TYPE	1999	2000	2001	2002	% Change 02 vs 01
CEM I	3 289 051	3 155 490	2 977 067	2 146 527	-27.9
CEM II A	2 523 738	2 522 163	2 714 994	3 605 823	32.8
CEM II B	1 596 884	1 759 790	1 839 139	2 278 044	23.9
CEM III	506 991	483 261	488 212	494 416	1.3
GGBS Slag	343 783	372 652	495 645	501 777	1.2
FLY ASH	134 269	130 604	105 541	118 806	12.6
MASONRY MC 12.5	64 102	49 211	16 418	456	-97.2
OTHER	548 801	518 258	528 170	478 419	-9.4
TOTALS	9 007 599	8 991 428	9 165 186	9 624 270	5.0

Data Source: CNCI

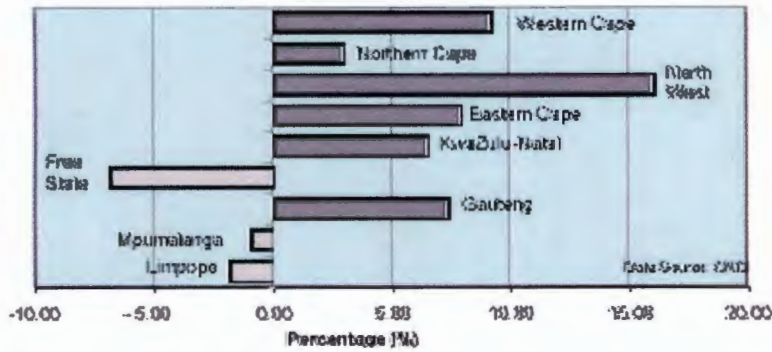
TABLE 10: SALES BY END USE SECTOR, 1999 – 2002 (Volume in tons)

End Use Sector	1999	2000	2001	2002	% Change 02 vs 01
Concrete Product Manufacturers	1 297 950	1 460 701	1 513 676	1 618 932	6.95
Ready-mix Producers	1 076 051	1 142 686	1 036 998	1 209 762	16.66
Resellers	4 658 123	4 433 997	4 584 945	4 773 070	4.58
Civil Construction (Direct)	414 558	442 219	444 611	401 759	-4.34
Building Construction (Direct)	780 724	671 337	715 514	669 945	-9.64
Mining	246 520	224 323	221 988	232 430	4.70
Blenders	315 122	406 896	450 041	448 786	-0.28
Other	218 551	209 271	217 411	269 586	24.00
TOTAL SALES	9 007 599	8 991 430	9 165 184	9 624 270	5.01

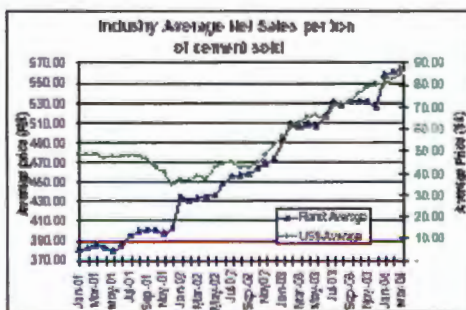
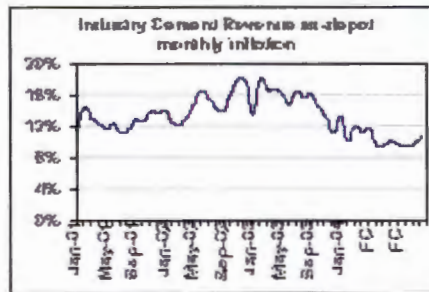
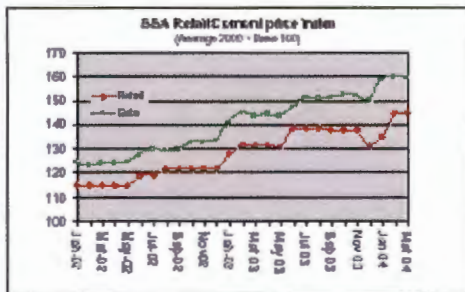
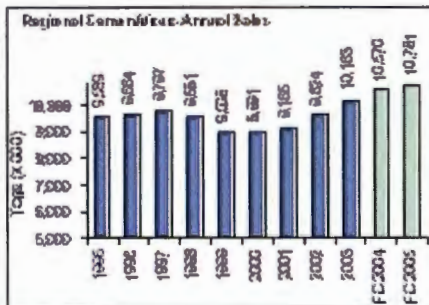
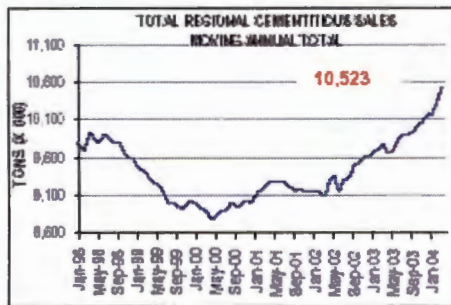
Data Source: CNCI

Appendix II

GRAPH 16: CEMENTITIOUS DEMAND BY PROVINCE, 2002 vs. 2001



1. Regional Cement Market



Appendix III

Market Survey

This market Survey will enable Canon to assess the market share of each major role player in the Cement Industry and is meant for MBA studies.

1. What was your stock of cement in the following years?

PROVINCE:								
Retailer	Stock							
Name	1997	1998	1999	2000	2001	2002	2003	2004
A								
B								
C								
D								
E								
Total								

2. What brands have you been purchasing in the past years.

PROVINCE:								
Retailer	Brand							
Name	1997	1998	1999	2000	2001	2002	2003	2004
A								
B								
C								
D								
E								

3. Do you purchase this brand because of price?

Yes No

4. Do you purchase this brand because of good service?

Yes No

5. In your view is there price difference in cement brands?

Yes No

Thank you for your time.