# THE CARTEL DECISION-MAKING EQUATION AND CARTEL DETERRENCE: A SOUTH AFRICAN PERSPECTIVE[1]

**RATSHIDAHO MAPHWANYA[2]**

## ABSTRACT

The prosecution of cartels must be seen from two perspectives; firstly, the immediate dissolution of active cartels brings instant reprieve to those harmed by the conduct. Secondly, the deterrence of future cartels. This may involve the deterrence of firms that have already colluded from colluding again or alternatively, the deterrence of firms that have not colluded before from ever colluding in the future. This paper considers the impact of the competition authorities' interventions and the competition enforcement environment in general on cartel deterrence. The analysis is conducted under the auspice of the cartel deterrence equation which shows that firms will only be deterred from engaging in cartel conduct if the expected sanction is more than the additional profits (and other benefits ) derived from collusion. The expected sanction being the actual penalty imposed after successful prosecution times the probability of detection. I use two distinct methodologies to make inferences on the state of the overall cartel decision-making equation in South Africa. I make use of a survey of competition lawyers Secondly, I have also compiled a database of South African cartels; I use data such as the duration of South African cartels and various features of this database to also make inference on the cartel deterrence in South Africa. My results show that the South African competition authority is doing well for a relatively new authority however there are areas of improvement.

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[2] Ratshidaho Maphwanya is an Economist in the Policy & Research division of the Competition Commission of South Africa. The views expressed in this paper are the views of the author in his personal capacity and do not necessarily reflect the views of the Competition Commission.

## 1. INTRODUCTION

One of the great preoccupations of competition authorities around the world is the investigation and prosecution of hard-core cartels. Cartels form when firms that are in a horizontal relationship decide to cooperate instead of competing. Saved from the burden of rivalry, firms are able to charge prices and supply output levels that would not be possible under conditions of competition. This has a negative impact on the cartel's customers and ultimately on consumers. Cartel conduct is considered the most egregious of all anticompetitive conduct available to firms and this is reflected in the manner in which this conduct is dealt with by competition authorities around the world. South African competition law is no different with cartel conduct outlawed in the Competition Act.

The enforcement of anti-cartel laws forms the backbone of competition policy around the world – a competition authority must ensure that it puts in place measures aimed at not only prosecuting cartels but also at deterring future cartel conduct. The enforcement of cartel conduct (and anticompetitive conduct in general) must therefore always be considered as twofold: prosecuting existing cartels and also deterring the formation of future cartels either by the same firms (specific deterrence) or by other firms (general deterrence). There are several studies that have been dedicated to revealing the immediate impact of prosecuting cartels; my study focuses on the latter: the deterrence effect of the competition authorities' various intervention and measures.

The analysis is conducted under the auspice of the cartel deterrence equation which shows that firms will only be deterred from engaging in cartel conduct if the expected penalty[3] is more than the additional profits[4] derived from collusion. The expected penalty being the actual penalty imposed after successful prosecution times the probability of detection. For a particular penalty amount, as the probability of detection increases from 0 to 1, the expected penalty approaches the actual penalty. The value of the penalty and the probability of detection can be influenced by various factors, some of which can be controlled by the competition authorities. This means there are levers available to the competition authorities which they can 'pull' in order to increase deterrence. Some of these are straight-forward such as merely being seen to be enforcing the available anti-cartel laws however others require a bit more of a concerted effort on the part of the authorities.

Conducting a study of the deterrence effect of any policy or intervention is however not a straightforward exercise. This essentially involves a study of events that did not occur or at the very least were never detected by the authorities. It is my view that I have found reasonable proxies that can be used to measure this effect. Before getting into more detail it is important to clarify something about deterrence: deterrence cannot be measured with any degree of certainty i.e. there is no unit of measure of deterrence. The aim will therefore to use certain proxies to paint a picture of whether deterrence is likely to be high or low and also where the competition authorities can improve.

[3] Throughout the paper I use the phrase penalty or sanctions to describe not only administrative penalties but all other sanctions that may be imposed on a firm either by the competition authority, any other court or members of the public.

[4] Likewise, the profits of collusion must be interpreted to refer to not only monetary profits but also all the other benefits that accrue to firms in a cartel through the suppression of competition

I have relied on effectively two methodologies for my analysis. Firstly, I have used a survey of competition attorneys as a proxy for their clients with the aim of examining if their clients' actions/perceptions reveal a positive deterrence effect associated with competition enforcement. This approach is similar to other surveys that have been conducted previously. Secondly, I have also compiled a database of South African cartels which includes data on the duration of each cartel, and other information that can be used to make inferences on the state of cartel deterrence in South Africa. Importantly, the results of both these studies are considered under the cartel decision-making equation with the aim of understanding how each aspect influences this equation.

The rest of the paper proceeds as follows: section 2 presents a very brief literature review on cartel deterrence and the cartel decision-making equation, section 3 discusses a few important aspects about my methodology, section 4 presents my survey results, section 5 presents the results of my cartel data analysis and section 6 concludes.

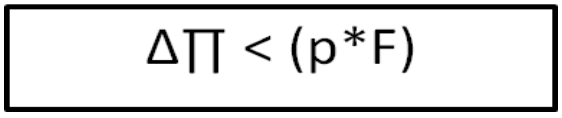
## 2. THE ECONOMICS OF CARTEL DETERRENCE

The objectives of competition enforcement (with regards to cartels) must be twofold: the detection and prosecution of existing cartels, and, ultimately, the deterrence of cartel formation in the future (Agisilaou, 2013). In this regard, it is necessary to distinguish between general and specific deterrence. General deterrence refers to the deterrence of contraventions *ex ante* by threatening violators with heavy enough sanctions such that they do not contravene in the first place (Buccirossi *et al,* 2009). Specific deterrence on the other hand refers to the deterrence of a violator *ex post;* imposing a heavy enough penalty such that they do not contravene again in the future (Smith and Gartin, 1989).

From this it becomes clear that the primary objective of a competition policy regime must be general deterrence even if only for the reason that it allows for the targeting of many more contraventions before they have even happened. This allows for significant savings in resources. In addition to this, the concept of marginal deterrence must also be kept in mind. This refers to ensuring that the sanction is proportional to the severity of the conduct such that violators get harsher sanctions for more severe violations (Shavell, 1992). The idea is that even those offenders that are not deterred must recognise the additional cost of engaging in more severe violations as opposed to less severe ones. Section 59 (3) of the Act reflects this, as well as the Commission and the Tribunal's approach to penalties as outlined in the Draft Penalty Guidelines (Commission, 2014).

A successful cartel deterrence framework must ensure that the costs associated with detection and prosecution outweigh the benefits of collusion (Motta, 2008). A firm will only be deterred from colluding if the costs of colluding expressed as the severity of the sanction multiplied by the probability of detection exceed the additional profits derived from colluding. This can be expressed using the following formula:

**Figure 1: Criminal Decision-Making Equation**




*Source: Motta (2008)*

Where $\Delta\prod$ is the additional profits derived from colluding, p is the probability of detection and F is the penalty imposed upon detection and prosecution. A firm will only be deterred from colluding if (p*F) exceeds $\Delta\prod$. The product (p*F) can be described as the expected penalty. For a given penalty, as the probability of detection increases (from 0 towards 1), the expected penalty also increases and deterrence is strengthened. Below we consider the make-up of this equation; the idea is to show from a point of literature how these variables change and to a certain extent can be influenced by competition authorities. My research focuses mostly on the two variables that make up the expected penalty – the probability of detection and sanctions.

### 2.1. The Probability of Detection

The probability of detection is one of the centre pieces of a deterrence strategy. It would be useless for a competition regime to put in place harsh sanctions if they are not accompanied by a competent detection plan. The expected value of a fine equals the actual value of the sanction times the probability of detection (Landes, 1983). As the probability of detection increases from 0 to 1, the expected value of the fine for the cartelists also increases and this leads to a higher level of deterrence. Bryant & Eckard (1991) were until recently the only economists to attempt to estimate the probability of detection for firms in a cartel. These authors used data from a sample of 184 cartel conspiracies that were detected by competition authorities in the USA between 1961 and 1998 to run a statistical model that relied mostly on the durations of cartels that were detected during that period.[5] The results of the model showed that the probability of detection for a cartel (that would be detected at some point) in any given year was between 13% and 17%. They did note that these were likely to be upper bounds given that they had relied only on data from cartels that *had* been detected.

Combe, Monnier & Legal (2008) relied on the model developed by Bryant & Eckard (1991) to replicate this research for the EU. These authors estimated the probability of detection for cartels in the EU to be between 12.9% and 13.3%. Both of these studies reveal the very low probability that a cartel that will be detected in the future will be detected in any one year – when this is coupled with the fact that this does not take into account cartels that were never detected in the first place, the implications are even more discouraging from a cartel deterrence perspective. This reaffirms the need to improve detection methods and also to increase the level of sanctions which will increase the expected penalty.

The methodology employed by these economists is of great value to my research however due to differences in the stage of development of the South African competition authorities cannot be directly transferred to my research. These authors relied on a statistical birth and death model which describes the onset and duration of cartels. The authors then use maximum likelihood methods to estimate the model's parameters. The parameters estimated are the number of cartels (active that are eventually caught) and the probability of getting caught in any one year. This methodology is however based on a very specific set of assumptions. The most important of which is the stage of development of the competition regime. The model parameters referred to above can only be estimated when *T* is large which is tantamount to when the competition regime has reached steady state. This would be an unsustainable assumption for the South African competition regime. The South African competition regime is

[5] The model used by these authors will form the basis of my estimation of the probability of detection and hence will be covered in much greater detail in my methodology chapter.

currently about 15 years old with the introduction of credible anti-cartel enforcement even younger than this.

Notwithstanding the difficulty in applying these models in South Africa, there is still value to be gained from their inclusion. Both studies include (as part of their broader studies) results on the average duration of cartels in their respective jurisdictions. This measure is useful inasmuch as it indicates the likely survival of a cartel in a particular jurisdiction. This can be considered as an imperfect proxy for the probability of detection. The length of time a cartel will be able to survive will be influenced by a number of things such as the efficiency of the cartel but importantly also the efficiency of the competition authority. Bryant & Eckard (1991) calculated the average duration for cartels in US to be 6.25 years. Combe *et al.* (2008) calculated this average for cartels in the EU to be 7.6 years. There are a few other studies that have also calculated the average duration of cartels without necessarily calculating the probability of detection. Connor and Zimmerman (2005) use a sample of 167 modern international cartels detected between 1990 and 2004 to calculate the average duration of about 6.3 years. Levenstein & Suslow (2006) use a sample of 72 cartels detected in either the US or the EU between 1990 and 2006 to calculate an average duration of about 7.5 years.

Two key points to note:

- Firstly, the research presents results of the probability that a cartel that was eventually detected would have been detected in any one year. This research provides no insight into the 'global' probability of detection for cartels in general.
- Secondly, because competition authorities (but more importantly firms) themselves do not know this 'global' probability of detection they will rely on inferences from signals they receive from the competition environment in general and also the competition authorities in particular.

The second of these observations is the other key to my research question – the fact that firms are unlikely to know this 'global' likelihood of detection, means they will most probably rely on their perceptions of this probability which will be formed based a collection of information gathered from observing the market and the competition authorities. Most potential criminals are not completely well-versed on the actual efficiency of the justice system and hence will rely on any signals being given out (Cook, 1980). Competition authorities can influence the signal that is sent out, increasing cartel deterrence. The most effective signal that competition authorities can send out is through the enforcement of competition law as firms will respond to this observable signal (Besanko and Spulber, 1989). If firms can see the competition authorities prosecuting anti-competitive conduct, it is likely that fewer firms will engage in such out of fear of prosecution.

A tool employed by competition authorities that increases not only the global probability of detection but also the perceived probability of detection is the leniency policy. Leniency policies allow for firms that participated in cartels to confess their contraventions in exchange for immunity from (or leniency in) prosecution (Aubert, Rey and Kovacic, 2005). This 'deal' is generally done in exchange for information that will assist the competition authority in prosecuting the other firms in the cartel. The reason leniency policies are successful is that they turn collusion into a *prisoner's dilemma* type game where each firm in the cartel constantly has to consider whether its fellow cartelists are going to apply for leniency and whether it should beat them to the door (Harrington, 2008); this can destabilise a cartel a great deal.

Inasmuch as they I increase the probability of detection, leniency programs can actually only work if they are accompanied by a probability of detection greater than zero (Harrington, 2008). As firms perceive the probability of detection to be increasing, it becomes more likely that firms will apply for amnesty. Facing eminent detection by a competition authority, applying and receiving immunity becomes a much more attractive option. Firms are less likely to apply if they believe they will not get caught. This is the reason why competition authorities may be tempted to exaggerate their effectiveness at detecting cartels as this creates the impression of a probability of detection approaching 1 (Miller, 2009). Events such as high profile cartel busts and dawn raids may increase the perception that cartel conduct is likely to be detected. The game at play between the competition authorities and the firms in the cartel is a game of perception. Do the firms perceive the probability of detection to be high enough to them to be deterred?

### 2.2. Sanctions

A large enough sanction (coupled with a high probability of detection) is likely to increase cartel deterrence (Bishop & Walker, 2002). The most commonly applied sanction for contraventions of competition laws is an administrative penalty/fine.[6] Fines are effective in that they target firms where it matters most: the bottom line. Fines should be high enough to at least cover the harm that accrues to all the economic actors that are affected by the conduct (Page, 1990). Unless the fines are high enough to make collusion unprofitable, they will not be able to achieve their deterrence outcome (Cyrenne, 1999). The optimal penalty for a cartel should be equal to the sum of the deadweight loss and the wealth transfer that occurred from consumers/customers to the cartel (Page, 1990). This can also be explained as the penalty being equal to the net harm that is imposed by the cartel on everyone except the cartel members (Landes, 1983).

It may seem tempting to argue in favour of fines that approach infinity however if fines are too high and there is little difference between fines based on the severity of the conduct, firms are likely to choose the worst possible contravention if they are to contravene the law (Stigler, 1970); this can be linked to the marginal deterrence argument (Shavell, 1992). Competition authorities must set penalties with the principles suggested by Page (1990) and Landes (1983) while exercising a certain level of caution and considering the principles of proportionality and marginal deterrence.

Certain jurisdictions, South Africa included, apply a cap on the financial penalty that can be imposed on firms that contravene competition laws. This means that it is not inconceivable that there may be instances where the optimal penalty to deter cartels is not within a competition authority's reach. A study conducted on a sample of 191 cartels in the EU shows that in 37% of the cases, the cartel overcharge exceeded the maximum possible fine (Smuda, 2012). In these cases, the optimal penalty to achieve deterrence was not within the reach of the competition authorities. This suggests that a successful deterrence strategy may have to include other tools above and beyond financial penalties.

Firms that have been found guilty of collusion may also be the subject of civil claims by their victims. Allowance for civil claims by third parties increases the severity of the punishment imposed on cartel members and hence increases deterrence (Frazer, 1995). The fact that civil claims are generally not included in the granting of amnesty as part of leniency

[6] Administrative penalties are however not the only sanction firms prosecuted for cartel conduct are exposed to.

application means that the threat of damages is likely to be a strong deterrent (Levensteain and Suslow, 2011). This may however also serve to discourage leniency applications as firms fear the imposition of civil damages even after being granted immunity from prosecution by competition authorities.

In addition to the financial (administrative penalties and civil claims) and criminal penalties imposed, there are other penalties that may influence the behaviour of firms: reputational damage is one example. As the sinister nature of cartel conduct becomes better known by customers, suppliers, competitors and members of the public, it becomes more likely that firms that are prosecuted for cartel conduct will suffer reputational damage (Buccirossi *et al,* 2009). This reputational damage can itself be considered as an additional monetary sanction if some of the firm's customers or suppliers are unwilling to continue doing business with a firm that has been found guilty of being in a cartel.

In certain jurisdictions, executives/employees who are found to have engaged in cartel activity (on behalf of their firms) can also be prosecuted in criminal proceedings (Kolasky, 2004). Unlike other sanctions, criminal prosecution links competition contraventions to the personal well-being of the people involved in these activities. By threatening people with possible jail time, competition authorities restrict the ability of company executives to divorce themselves from the actions of their firms. This seemingly heavy-handed approach is premised on the belief that explicit cartel conduct is a very serious economic crime (Lipsky, 1991). If the point of departure is that explicit collusion *is* an act of crime then it follows intuitively that it should be prosecuted as such.

The combination of administrative penalties, civil damages and (where applicable) criminal sanctions make up the combination of factors that firms must weigh against additional profits when making on decision on whether or not to form/join a cartel. Competition authorities must therefore ensure that this combination of tools is set a level high enough to discourage anticompetitive conduct.

## 3. A BRIEF NOTE ON MY METHODOLOGIES

My research seeks to assess the state of the cartel decision-making equation for South Africa. I have used a few proxies to make findings on certain aspects of the equation and when the results are considered in their entirety, it becomes possible to make findings on the state of cartel deterrence in the country. This research does not seek to find definitive values for the variables in the equation, it is doubtful any research could be able to do that, however there is still value in probing their likely behaviour as this gives great insight into deterrence.

I employed two distinct methodologies in trying to answer my set of research questions. Firstly, I have conducted a survey of competition lawyers. Surveys have been used in the past to get insight into questions around cartel deterrence (See the survey by the OFT (2007) and also by the Commission and Tribunal (2009)).[7] I surveyed competition lawyers as proxies for the firms in the market. In this particular instance, I use the survey to examine the behaviour of firms in response to the competition authorities and the competition regime in

[7] This is mainly because secondary data on firm behaviour when it comes to this aspect is by definition not avaialble

general. This is directly linked to the questions around the perception of the probability of detection discussed above.

The rationale for choosing to survey attorneys was that (to a certain extent) they are able to express views on behalf of their clients but also importantly they have insight into how their clients generally respond to various competition related issues. The survey was conducted with the top competition law firms in the country[8] and asks questions related to cartel deterrence, the CLP and criminal prosecution of individuals for cartel conduct. The survey generally had a low response rate however there are two caveats to keep in mind on this aspect. Firstly, the responses were reflective of views from all the major law firms in the country (which in itself is a very small population size). Secondly, other research done on this field has also suffered from a low response rate which is likely to be linked to issues of confidentiality. My survey had a response rate of about 18%.[9] A survey by Feinberg (1985) on a similar subject matter had a responses rate of 18%. The survey by Benckenstein & Gabel (1982) had a response rate of 29.8%.

Surveying competition lawyers as a proxy for their firms is not unfounded. A similar methodology was employed by Feinberg (1985) and also by Benckenstein & Gabel (1982). The OFT (2007) also supplemented its company survey with a survey of competition lawyers. Lawyers have access to information on the conduct of their clients which can provide great insight for someone looking to study firm behaviour. The survey was conducted using questionnaires that were sent to respondents via email and a few preliminary interviews.

The second methodology I have employed is a statistical analysis of a database I compiled based on information on cartels prosecuted in South Africa. The database includes information on hard-core cartels that have been detected by the Competition Commission in the years since the introduction of the Competition Act in 1999. The information included in the database is on aspects such as the duration of each of the cartels, how each of them were detected and also other aspects of the arrangement. I use this database to make certain findings on the state of cartel deterrence in the country.

The main aspect of this study is the duration analysis in which I study data on the duration of South African cartels and calculate an average duration for South African cartels. Due to limitations on the state of the competition environment in South Africa, it is not possible to run the same birth and death process used by Bryant & Eckard (1991), however, there is still value in performing this kind of analysis particularly in the context of the broader study including the survey I have conducted. Importantly, my intention is to be able to compare my results to studies such Bryant & Eckard (1991) Combe, Monnier & Legal (2008), Zimmerman & Connor (2005) and also Levenstein & Suslow (2006) which include estimates of the average duration of cartels in various jurisdictions. This can be used to draw inferences on the effectiveness of the South African competition enforcement regime by comparing it to other more developed competition jurisdictions.

[8] This is based on reviews released by the Global Competition Review available at http://globalcompetitionreview.com/surveys/article/37416/south-africa accessed on 27/01/2015 at 21:39. Requires subscription

[9] Bowman Gilfillan indicated a preference to send one response for the firm which means the response rate is actually about 21%

The thinking is that if a competition authority is effective at detecting cartels that are active within its jurisdiction then it is likely that cartels will be active for a relatively shorter duration. With this in mind, it is also likely that firms will know this (as they observe cartels in the economy with a short lifespan) and they will be relatively less inclined to participate in collusion. Although imperfect, this analysis can still be used as a fair proxy for cartel deterrence in South Africa. Most of the data required for the database was be collected from the website of the Competition Tribunal (www.comptrib.co.za) where decisions on all completed competition cases are published. I have only considered instances of hard-core collusion and disregarded all other horizontal agreements. Also, in instances were cartel members are prosecuted on a piecemeal basis for whatever reason (which is usually the case) I have considered this as one cartel. My analysis is conducted for the period 1999 to 2012.

Both of these methodologies, although different in application, present key information on the state of cartel deterrence in South Africa. It is important to keep in mind that cartel deterrence cannot be measured with certainty i.e. there is no unit of measure of deterrence. What can however be achieved, and it is my view that I have achieved this, is an analysis of the various factors that influence deterrence. This kind of analysis provides insight into whether firms in the country are likely to sufficiently deterred or not. It also allows me to make certain recommendations on what aspects of South Africa's cartel enforcement can be improved.

The next two sections present my results and the analysis.

## 4. ANALYSIS OF SURVEY RESULTS

The results of my survey are presented below. I have presented the main findings of the survey in this discussion without necessarily analysing each individual question.

### 4.1. Response to Competition Enforcement

The first group of questions in the survey asked questions around how firms respond to competition enforcement in general. The main question asked the attorneys to gives estimates of the proportion of their clients that apply for leniency once they have been given information that they may have contravened the Act. For the firms that do seek external legal advice on their conduct, prior to seeking legal advice, they may have been uncertain about whether or not their conduct contravened the Act however after getting advice from attorneys there is no longer uncertainty. Firms are now aware that their conduct violates that Act and they have to make a decision on how to proceed knowing that detection by the Commission will result in sanction. A firm that considers its cartel decision-making equation at this point and is deterred will likely apply for leniency as this saves it from the likely sanction. A firm that is not deterred may choose to not apply for leniency.

**Table 1: Overall Average Percentage Responses for Question 2**

| Range | Responses |
|---|---|
| **0-50%** | 32% |

| | |
|---|---|
| **50-60%** | 31% |
| **60-70%** | 3% |
| **70-80%** | 0% |
| **80-90%** | 0% |
| **90-100%** | 35% |
| **Total** | 100% |

*Source: Own Survey and Analysis*

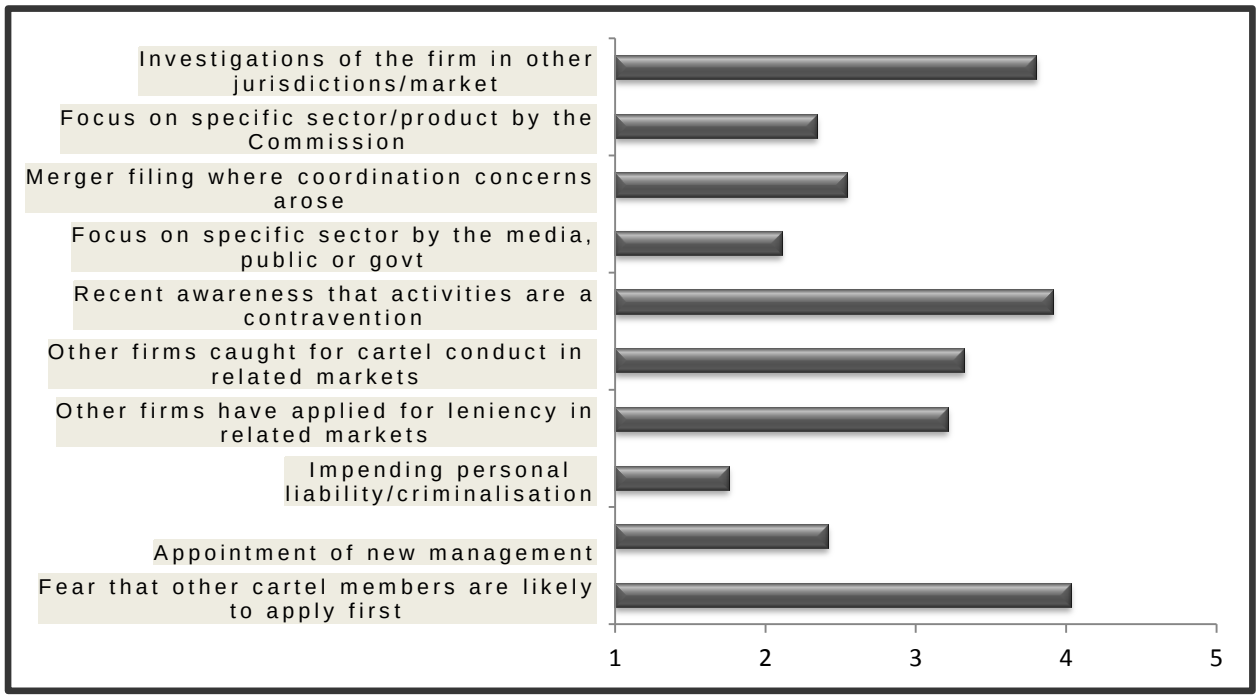
More than 60% of the respondents submit that of their clients (who received legal advice that they may have contravened section 4 of the Act), less than 60% applied for leniency; the balance do not apply for the CLP. In fact, only 35% of the attorneys responded that more than 90% of their clients apply for leniency after they are informed that their conduct contravenes the Act. For the firms that do not apply for leniency, it is not possible (nor is it necessary for this analysis) to determine what their next move is i.e. do they continue with the conduct or do they stop colluding. This is not the appropriate consideration; what matters is that these firms have considered their respective cartel decision-making equations and were not deterred from colluding because the benefits of collusion for them outweighed the costs.

This high number of firms not applying for leniency even though they know they have contravened the Act has particularly negative implications for the competition authorities. Practically, it implies that a substantial number of firms either consider the probability of detection to be low enough that it makes collusion worth the risk, or alternatively, the sanctions that are imposed by the competition authorities (and society in general) are low enough to make collusion worth the risk. This is not to say all is lost; far from it. Even though the police have always enforced the law, there is still crime. The fact that there are more firms that apply for leniency after getting legal advice than those that don't suggests that competition authorities are having a deterrence effect even if it is not unqualified.

### 4.2. Drivers of Leniency Applications

The next major subject considered in the survey is the drivers of CLP applications. These are the features of the jurisdiction that are leading to firms applying for leniency. Firms are likely to inform their attorneys of the reasons they have decided to apply for leniency. The respondents were given a list of 10 factors which may influence CLP applications and asked to rank each factor's importance on a scale of 1 to 5 with 1 meaning not important and 5 meaning very important. I used the responses to compute average scores for each factor and these are presented in a bar graph below.

**Figure 2: Drivers of Leniency Applications**




*Source: Own Survey and Analysis*

The figure above shows what the respondents consider to be the main drivers of CLP applications. The factor that the respondents consider to contribute the most to firms applying for leniency is the fear that other firms in the cartel will apply first. This is obvious vindication for the CLP as this means that the prisoners dilemma effect mentioned above has a notable impact on firms' decision-making and hence on deterrence. Another factor that is considered important is recent awareness that the conduct is a contravention. The importance placed on this particular factor is surprising as the Act has been in place for about 15 years; it is surprising that there are firms that are still finding out that certain conduct is a contravention of the Act.

The presence of a competition investigation of the firm in other jurisdictions or markets also appears to be important to firm when applying for leniency. This is also not particularly surprising as a firm is likely to consider the fact that a competition authority is investigating it in one market/jurisdiction to mean the probability of detection has increased for all the contraventions the firm is involved in. The forth most important factor is when other firms have been caught for cartel conduct in related markets. When the Commission catches other firms in a related market, firms appear to interpret this as an increase in the probability of detection.

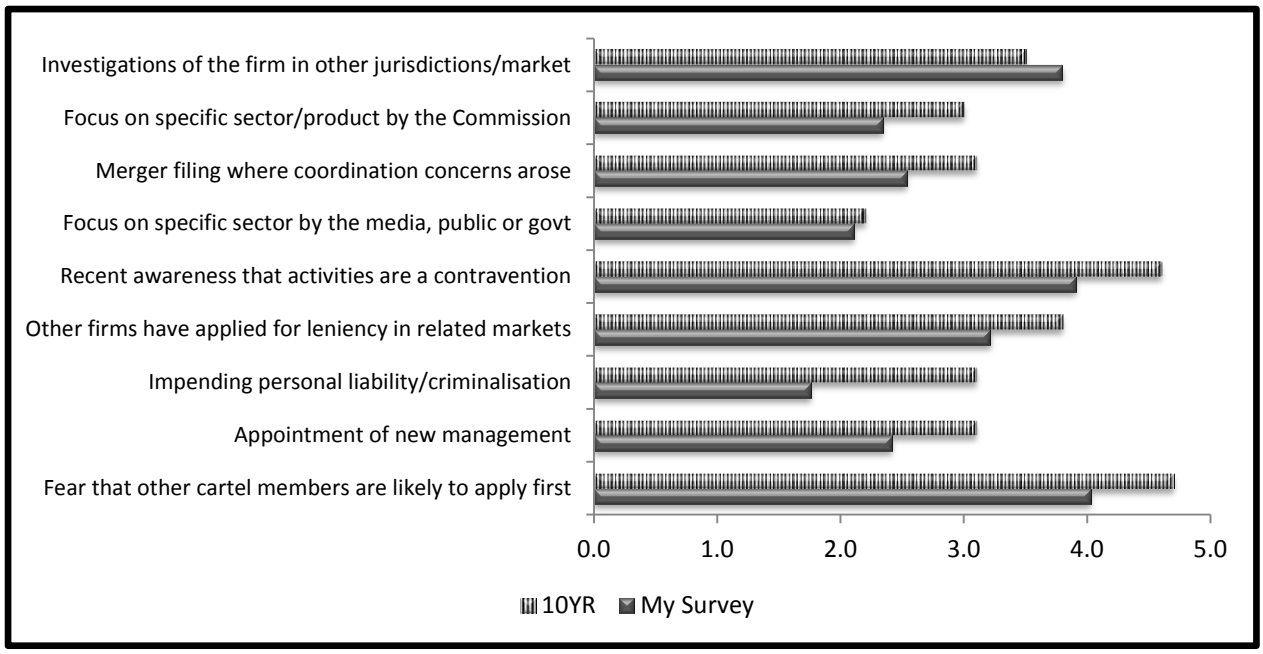
What is surprising however is how little weight the respondents gave to factors such as focus on a sector by the Commission or by the public, media or government. It appears firms do not consider this to increase the probability of detection and hence it does not prompt them to apply for leniency. It appears firms will respond to the Commission actually catching other firms out for collusion but not to the mere fact that the Commission is investigating other firms. This supports the finding from literature that public enforcement of the Act is likely to

be a deterrent. The Commission must therefore continue to benefit from the publicity its interventions are receiving as more firms are likely to believe that they are next.

The respondents submit that impending personal liability or criminalisation has minimal impact on firms applying for leniency. I would have expected that firms would be weary of criminalisation being introduced which would substantially increase the sanction for cartel conduct however it appears this is not the case. It may be that the delay in actually implementing this has led to firms believing it will not come into effect in the short to medium term. It would not be surprising to see a large number of leniency applications when the date for the implementation of criminal sanctions is announced and the prospect becomes a reality.

Below I compare my results to the results of the survey done by the Commission for the 10 year review. This survey was conducted 5 years ago in 2009. The solid lines are responses for my survey. The lines with a pattern are responses from the 10 year review survey.

**Figure 3: 10 Year Review CLP Survey Comparison[10]**




*Source: Competition Commission (2009) and own survey*

The factor that is considered most important by respondents to both surveys is "the fear that other cartel members are going to apply for leniency first". As noted above, this is a positive sign that the CLP has a strong deterrence effect through the prisoner's dilemma effect. The rank of the importance of the different factors has remained broadly the same across the two surveys however the relative importance placed on specific factors by the respondents has decreased. In essence the average score achieved by each of the factors has decreased although the rank remained the same.

It is less important whether the respondents considered the fear that other firms will apply for leniency as very important as opposed to important, what matters most is what factors are

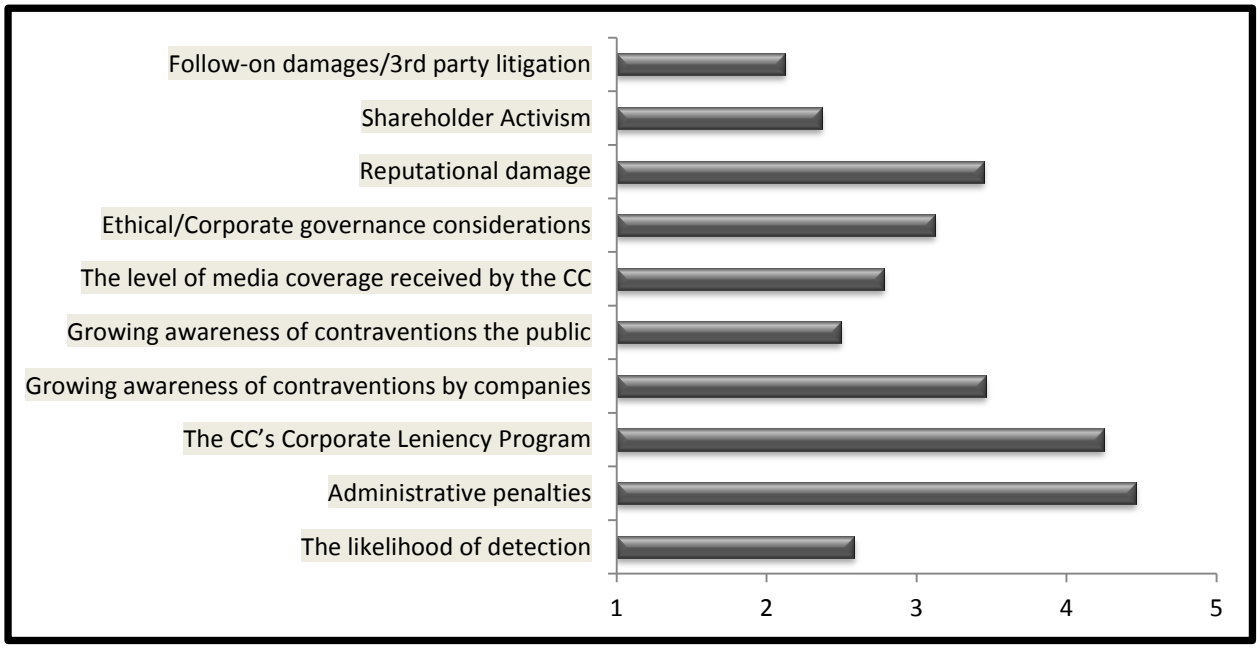
[10] The factor "Existing Investigation by the Commission" was not listed in my survey

driving CLP applications relative to each other.[11] These are factors that can be influenced by the competition authorities in order to increase deterrence. For instance, the fact that the recent awareness that certain conduct is a contravention is the second most important reason for applying for leniency in both surveys is of much more value to the Commission than whether it had an average score of 4.1 vs. 3.8. The relative importance suggests that the Commission can increase CLP application by publicizing the kind of conduct that can lead to contraventions.

### 4.3. Drivers of Deterrence

The respondents were also asked to rank the importance of a range of factors when it comes to influencing cartel deterrence. The respondents were given a list of 10 factors which may influence cartel deterrence and asked to rank each factor's importance on a scale of 1 to 5 with 1 meaning not important and 5 meaning very important. The results are again presented in a bar graph.

**Figure 4: Drivers of Cartel Deterrence**




*Source: Own Survey and Analysis*

According to the respondents, the factor that is most important to cartel deterrence is administrative penalties. This is unsurprising as profit maximizing firms are more likely to respond to sanctions that affect their bottom line. There is a question of whether administrative penalties are high enough to actually deter firms from colluding; empirical studies cited above suggest they are not however my survey responses are unsurprising given the identity of the respondents. The 10% cap on administrative penalties probably also does not help as far as improving deterrence – Smuda (2012) showed how in most

[11] Whether something is important or very important is a subjective consideration; what matters most is which factor is more important than the next

instances, the penalty that would be sufficient to deter firms from colluding is usually not available to the competition authorities due to the cap (in section 59 (2) of the Act in the case of South Africa).

This is an important consideration from a deterrence perspective; it may be that the remedy is a change in the law allowing for penalties in excess of 10% even if just for cartel conduct. However, I would posit that the competition authorities would struggle to convince lawmakers of the need for this. The Tribunal's website reveals that in the 2012/2013 financial year, the average penalty applied by the Tribunal for cartel conduct is 4.25%.[12] Only a handful of firms caught in cartels have received fines above 7% with most cartelists actually being fined less than 5% of their turnover (Muzata, Roberts and Vilakazi, 2012). The Tribunal is therefore not applying anywhere near the maximum allowable penalty for cartel cases.

Another factor considered important as far as driving deterrence is the CLP. This is to be expected; the literature is very firm on the likely impact of a leniency policy on cartel deterrence. Other factors that the respondents consider to be important are the growing awareness by companies that their conduct is a contravention and also the reputational damage associated with being found to have been in a cartel. These two factors are interesting as they speak to an increased appreciation of competition law by stakeholders in the economy. Reputational damage must also be considered as forming part of the group of sanctions.

What appears surprising is the low importance attached to the growing awareness that conduct is a contravention by the public (it had the 2nd lowest average score), given the high importance attached to reputational damage. It may be that firms are more worried about reputational damage from the perspective of other firms or the state as opposed to members of the public.

### 4.4. Criminalisation and Strengthened Deterrence

The attorneys were also asked a question on the likely impact of the introduction of criminal prosecution for individuals involved in cartel conduct and whether this was likely to improve deterrence. More than half (56%) of the respondents believe that the introduction of criminal prosecution for individuals involved in cartel conduct on behalf of their firms will *increase* cartel deterrence. These responses are consistent with most economic literature on the deterrence effect of criminal prosecutions. Some of the responses gave qualified responses mostly citing certain aspects that may influence its success or failure such the Commission being able to operationalise criminal prosecutions as a strong tool through cooperation with the National Prosecuting Authority.

A few of the responses (22%) submit that ever since the debate on criminalisation was introduced, their clients have asked about it and some even requested compliance training and other internal measures to insure that they are compliant with competition laws. This suggests there is already some deterrence effect that is resulting from the impending introduction of criminalisation even before it is actually introduced. It is likely that the

[12] There are three cartel decisions where the percentage turnover was not indicated

Commission will receive a large number of leniency applications just before the implementation of criminalisation.

The attorneys were asked questions on what they think may be hampering the CLP from being more success and also how the cartel deterrence can be improved in South Africa. One the first question, more than half of the responses (56%) cited the lack of protection for leniency applicants against follow-on damages as a factor that may dissuade firms from applying for leniency. Some respondents even noted that this may be more of an issue in the future when criminal prosecution is introduced. The respondents submit that the risk of further liability outside of the competition framework may harm the Commission's CLP.

On how cartel deterrence can be improved, there was very little consistency in the responses however the one issue that was brought up several times was protecting leniency applicants from prosecution or follow-on damages. Other suggestions recommended include improved efficiency in dealing with cartel cases by the Commission and also more predictability on how firms will be prosecuted especially when criminalisation is introduced. Unsurprisingly, none of the attorneys suggested an increase in penalties as a way of improving deterrence.

## 5. ANALYSIS OF THE DATABASE OF SOUTH AFRICAN CARTELS

### 5.1. Duration of South African Cartels

Using data from decisions and consent agreements published by the Tribunal, I have created a database that shows the duration of each cartel prosecuted by the Commission.

**Table 2: Collusion in South Africa 1999-2012**

| | |
|---|---|
| **Number of Section 4 Cases Completed** | 99 |
| **Instances of Hard-Core Collusion** | 27 |

In the period from the introduction of the Competition Act in 1999, the Commission has completed (i.e. finalised in the Tribunal either through settlement or prosecution) 99 cases that involved aspects of section 4 prohibited conduct. Of these cases, my analysis shows that there have actually been 27 instances of hard-core collusion in this period. The substantial disparity is because several of the cases were not instances of hard-core collusion but involved other prohibited horizontal arrangement. There is also a lot of duplication in that firms that form part of the same cartel may be prosecuted through different proceedings. The table below presents the main findings on this study.

**Table 3: Basic Statistics on Cartel Duration**

| | **Results** |
|---|---|
| **Cartels** | 27 |
| **Mean** | 6.6 years (6 years, 7 months) |
| **Max** | 11.3 years (11 years, 4 months) |

The mean duration for a cartel that is eventually detected and prosecuted by the Commission is 6.6 years or 6 years and 7 months. This is how long a cartel that is eventually detected by the Commission will survive on average before it is detected. Determining which cartel was active the longest is not a straightforward exercise; the main reason for this is that there are several cartels that existed prior to the introduction of the Act in 1999. The cement cartel is one example of this; prior to 1996, the cement industry was a legal cartel through an exemption that dates as far back as the 1940s. When the exemption was withdrawn in 1995 however, the industry just continued to operate in that manner.[13] The precast concrete products cartel was active since the 1970s.[14] Several of the cartels in agricultural products stemmed from the marketing boards that had been sets up through the Marketing Act of 1937 as part of the government's broader interventions in the agricultural sector (Roberts, 2009). When the marketing boards were displaced in 1996, the different markets simply carried on as (now) illegal cartels. It is difficult to measure the duration of these cartels with precision. The fact that the Act came into place in 1999 suggests there may not be much value for our study to do so though.

Nonetheless, there are two specific cartels that were the longest running cartels in the post-Competition Act era. These two cartels that lasted roughly the same period before being eventually detected – these are the polymers cartel involving Sasol Polymers[15] and Safripol and the fishing cartel[16]. Both of these cartels preceded the introduction of the Act and were only detected in 2010. The cartels noted above, most of which preceded these two cartels, were detected before these two once the Act was in place.

Below I have compared my results to the results of other studies that have covered the same ground with regards to other competition jurisdictions.

**Table 4: Comparison of Results[17]**

| | Cartels | Period Considered | Mean |
|---|---|---|---|
| **My results** | 27 | 1999-2012 | 6.6 years |
| **Bryant & Eckard (1991)[18]** | 184 | 1961-1988 | 6.25 years |
| **Combe *et al.* (2008)** | 86 | 1969-2008[19] | 7.6 years |
| **Zimmerman & Connor (2005)** | 167 | 1990-2004 | 6.3 years |
| **Levenstein & Suslow (2006)** | 72 | 1990-2006[20] | 7.5 years |

It is remarkable how similar the results of all four studies are – despite the differences in the time period considered and also the jurisdictions within which the cartels operated, the

[13] See Competition Tribunal Case Number: 93/CR/Nov11
[14] See Competition Tribunal Case Number: 23/CR/Feb09

[15] See Competition Tribunal Case Number 48/CR/Aug10
[16] See Competition Tribunal Case Number 50/CR/May12
[17] I pay much closer attention to Zimmerman & Connor (2005) and Levenstein & Suslow (2006) as their studies are conducted over a similar duration to mine; they also consider cartels from a similar 'generation to mine
[18] Similar to Combe *et al* (2008), I have used an average of the results from DUR1 and DUR2 to compute one result for the papers.
[19] The authors did not indicate the cut-off date for their study but indicated that they consider cartels from 1969 to the present day; the paper was published in 2008.
[20] The authors did not indicate the cut-off date for their study but indicated that they consider cartels from 1990 onwards; the paper was published in 2006.

average duration for cartels that are eventually detected in each of the each of the studies is around 6 – 8 years. These results mean that a cartel which will eventually be detected by the competition authorities will, on average, last between 6 and 8 years before it is detected.

For completeness, the table below shows that jurisdictions that are studied in the papers I have compared my study against.

**Table 5: Competition Jurisdictions Compared Against**

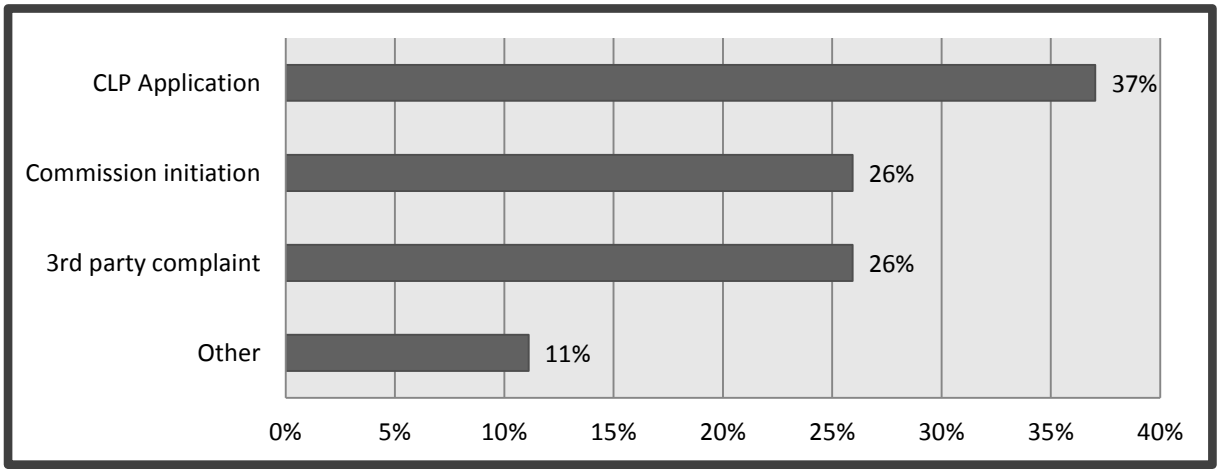
| | **Jurisdiction** |
|---|---|
| **My Study** | South Africa |
| **Bryant & Eckard (1991)** | USA |
| **Combe *et al.* (2008)** | Europe |
| **Zimmerman & Connor (2005)** | USA and Europe |
| **Levenstein & Suslow (2006)** | USA and Europe |

The work that has been done on this subject has so far covered Europe, the USA or a combination of the two. My results suggest that a cartel that will eventually be detected by the competition authorities is likely to survive on average for more or less the same duration in South Africa as cartels in Europe and the US. These results are fairly positive for the South African competition regime if only for the reason that it means the Commission and Tribunal are in good company.

### 5.2. Drivers of Detection

I have also considered the factors that are contributing the most to the Commission's enforcement efforts. These are the factors that have led to the detection of cartels in South Africa. The results are shown in the figure below.

**Figure 5: Method of Detection Frequency**




*Source: Own Data*

The figure above shows the factors that have that led to the cartel detections reported above. The factor that has contributed the most to cartel detection in South Africa is the Commission's CLP which has directly led to the detection of 37% of the cartels that have

been detected by the Commission. This is in line with the results of the survey discussed above and also economic theory.[21] The other two factors that have contributed to cartel detection are the Commission's own complaint initiations (26%) and also 3rd party complaints (26%).

A closer look at the dates when these cartels were detected also reveals that the CLP is likely to be the Commission's strongest tool for detecting and hence deterring cartels.

**Table 6: Date of Detection of Cartels**

| Year | Cartels Successfully Detected |
|---|---|
| **1999 – 2003** | 0% |
| **2004 – 2007** | 59% |
| **2008 – 2012** | 41% |

*Source: Competition Tribunal website*

The CLP was introduced in 2004[22] and then was amended in 2008.[23] My analysis reveals that none of the hard-core cartels that were detected and led to findings in the Tribunal ended or where detected prior to the introduction of the CLP. Although Lavoie (2010) reveals that there were few cartel complaints prior to the introduction of the CLP, my results reveal that none of these complaints actually led to any kind of finding in the Tribunal.

It also appears that no discernible trends can be noted around the amendment in of the CLP in 2008. In fact, there were more cartels detected in the three years between the introduction of the CLP and its amendment than in the four years following its amendment. These results must however not necessarily be interpreted to be saying the CLP is the single reason for all the Commission's success in its fight against collusion; it is important to keep in mind that the introduction of the CLP also coincided with the Commission starting to focus more of its resources towards the fight against cartels (Lavoie, 2010). It is likely that this added focus in general may have led to more cartels being detected by the Commission.

## 6. CONCLUSIONS

The results of my analysis paint a fairly positive picture as far as cartel deterrence in South Africa is concerned. This is even more so when considering the infant nature of our jurisdiction. The Commission began to focus on the enforcement of anti-cartel laws aggressively in 2004 when the CLP was introduced. These efforts have yielded results across several of markets. The work is ongoing though; it appears firms may still perceive the expected penalty to be low. It is hard to say if this is due to a low probability of detection or insufficient sanctions however collusion is not only ongoing but there are firms that risk detection even after being informed by attorneys that their conduct is a contravention.

The Commission's CLP has certainly had great success however there appears to be some challenges. It is difficult to argue with the number of cases that have been closed through leniency applications, however, it is concerning that there are still a large number of clients that chose to not apply for leniency after they have been informed that their conduct is likely

[21] See Motta and Polo (2003)
[22] See Notice 195 of 2004, Government Gazette No. 25963 of 6 February 2004
[23] See Notice 628 of 2008, Government Gazette No. 31064 of 23 May 2008

to be a contravention of the Act. Assuming that the clients accept that their attorney's legal advice is accurate, these firms have not been successfully deterred. These are firms that conclude that the benefits of collusion outweigh the expected penalty according to the cartel decision-making equation.

The results on the analysis of cartel duration however appear to paint a fairly positive picture of the South African competition regime. On average, a cartel that is eventually detected by the Commission survives for 6.6 years or 6 years and 7 months. Given the harm caused by hard-core cartels, this number will without a doubt concern policy makers and consumers alike. However, South Africa also appears to be in line with international jurisdictions which are much more developed. Given the resources that the Commission has continuously dedicated to the fight against collusion it is likely that this average may reduce over time as the Commission becomes more efficient and members of the public and the business community become more informed about competition law.

The Commission must also make efforts to ensure that this perception (of a low probability of detection) is removed. The Commission has already put in place anti-cartel enforcement measures which not only increase the probability of detection but also its perception – these would include things like the CLP and also settling up a specialised cartels division. These are likely to serve as a signal to business that the Commission is taking cartels seriously and hence firms are more likely to be detected if they continue to engage in such. In addition to this, the Commission may also manage its public image around the fight against cartels. A more publicised fight against cartels is likely to create a perception of efficiency which firms will receive as an increase likelihood of detection. A combination of all of this is most likely to breed positive results.

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