

**Assessing the validity of the Structure, Conduct and Performance paradigm as theoretical framework for the application of competition policy in the long-term insurance sector of South Africa**

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## **DECLARATION**

I, the undersigned, hereby declare that the work contained in this thesis is my own original work and that I have not previously in its entirety or in part submitted it at any university for a degree.

## ABSTRACT

In the recent past the industrialised world bore witness to staggering growth in the secondary and tertiary sectors of the economy. In the face of this growth process economic theory had to confront new challenges in explaining and interpreting economic phenomena. The complex nature of inter- and intra-firm relationships forced a pragmatic stance on policy makers to ensure that all actions are efficient and competitive.

Two prominent schools of thought with contradictory viewpoints emerged. The Structuralists built upon the foundations laid by Bain (1951) and Mason (1939). This implied a theoretical framework, namely the Structure, Conduct and Performance paradigm (SCP paradigm) that could be used to explain inter- and intra-firm relations according to a simple forward causality argument. The Structuralists' interpretation of the SCP paradigm provides strong support for the implementation of de-concentration measures by competition authorities.

The Chicago School, however, developed a counter-argument inspired by Demsetz's (1973) efficiency hypothesis. According to them, causality is reversed and de-concentration measures are used at the expense of the most efficient firms.

The thesis aims to study these contradictory arguments as well as their evolution in South Africa. Various researchers in South Africa have built on the arguments of the Structuralists and the Chicagoans regarding the manufacturing sector. The theoretical methods implemented by them will be applied to the long-term insurance industry to assess the validity of the SCP paradigm as a theoretical framework for the application of competition policy.

## OPSOMMING

Fenomenale groei in die sekondêre en tersiêre sektore van die ekonomie het nuwe uitdagings ter verklarings en interpretering van inter- en intra-ondernemingsverhoudings verskaf. Die komplekse aard van die verhoudings het 'n pragmatiese aanslag ter versekering van effektiwiteit deur beleidmakers genoodsaak.

Twee prominente denkskole met teenstrydige argumente het ontstaan. Die Strukturaliste het hulle siening op die werk van Bain (1951) en Mason (1939) gebaseer. Hierdie teorieë verwys na 'n teoretiese raamwerk, naamlik die Struktuur, Gedrag en Prestasie paradigma (SGP paradigma), wat gebruik kan word om inter- en intra-ondernemingsverhoudings aan die hand van 'n kousaliteitsvloei van struktuur na prestasie, te verklaar. Die Strukturaliste se interpretasie van die SGP paradigma verskaf ondersteuning vir die implementering van 'n dekonsentrasiebeleid deur mededingingsowerhede.

Die Chicago Skool het 'n argument ontwikkel wat op die effektiwiteitshiptese van Demsetz (1973) gebaseer is. Volgens hulle beweeg kousaliteit in die teenoorgestelde rigting as wat die Strukturaliste beweer en straf dekonsentrasie-maatreëls die mees effektiewe ondernemings.

Hierdie werkstuk het ten doel om hierdie argumente sowel as die evolusie daarvan in die Suid-Afrikaanse konteks te ondersoek. Verskeie navorsers in Suid-Afrika het op argumente van dié twee denkskole ten opsigte van die vervaardigingsektor voortgebou. Die teoretiese metodiek wat deur hulle ontwikkel is, sal aangewend word om die geldigheid van die SGP paradigma as die teoretiese raamwerk vir die aanwending van 'n mededingingsbeleid in die langtermyn-versekeringsbedryf van Suid-Afrika vas te stel.

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My Father in heaven, providing me with insight and motivation.

Illana, my wife, for her continuous support

Nicola for her guidance.

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## CHAPTER 1

### INTRODUCTION

In the recent past the industrialised world bore witness to staggering growth in the secondary and tertiary sectors of the economy. In the face of this growth process economic theory faced new challenges in explaining and interpreting economic phenomena. The complex nature of inter- and intra-firm relationships forced a pragmatic stance from policy makers, ensuring that all actions are efficient and competitive.

The intricate dynamics relating to various market structures have provided the inspiration for numerous industrial organisation scholars. The work done by Mason and Bain on the manufacturing sector of the United States in both the pre- and post-Second World War periods gave rise to a school of thought whose adherents are referred to as the Structuralists. This school has adopted a conceptual framework called the Structure, Conduct and Performance paradigm (SCP paradigm). The Structuralists' theoretical framework was based on the simple thesis of market structure conditions, e.g. monopolies, leading to conduct, e.g. abuse of dominance, which will have an effect on the performance, e.g. allocative inefficiency.

The elements of the SCP paradigm therefore indicate a certain causality in the dynamics of market formation, with perfect competition providing the most efficient and competitive paradigm and monopolies the most inefficient. This has important consequences for the application of competition policy as it provided a strong theoretical impetus for policy implementation to be biased against concentrated markets. Initially the SCP paradigm did not go unchallenged, until a new school of thought, the Chicago School, developed a strong argument indicating reverse causality based on Demsetz's efficiency hypothesis.

Harold Demsetz turned the SCP paradigm on its head with an article in 1973 in which he questioned the de-concentration measures implemented by competition authorities, referring to them as punishing the most efficient and cost effective firms. His efficiency

hypothesis implied that the most efficient firms (performance) led e.g. to increased spending on e.g. advertising (conduct), which inevitably led to markets becoming more concentrated as the most efficient firms confirm their superior efficiency (structure). The alternative argument to the SCP paradigm raises questions about the validity of the paradigm with regards to the extent that competition authorities could use it as a theoretical framework for the application of deconcentration measures.

Numerous studies (Smit, Leach, Reekie and others) employing various techniques have researched the causal relationship implied by the two opposing schools of thought. However, before the different interpretations of the theory can be discussed in full detail a thorough understanding of the underlying elements of the SCP paradigm is required. The thesis is therefore divided into an in-depth theoretical discussion of the various elements that comprise the SCP paradigm and the ambiguous causal relationships associated with it, as well as a pragmatic section where the theory is used by different researchers in an attempt to determine the validity of both arguments.

The practical part of the thesis gives due attention to the South African literature on the study of the concentration-profits relationship in the manufacturing sector. The theoretical tools are then applied to determine causality in the long-term insurance industry of South Africa. The long-term insurance industry is regulated by the Financial Services Board, which provides invaluable data in their annual reports to enable a study of this sector over a period of ten years (1990-1999).

A significant part of the industry study is aimed at determining the concentration levels within the industry. To ensure a complete account and accurate representation, the author employed six concentration measures in the study. Except for the Gini-coefficient, the summary and absolute measures indicate a forward relationship. The long-term insurance sector further reveals a picture of constant high ten-firm concentration ratios over the period of ten years. It would appear, however, that the power consolidated within the top ten firms, especially the top four, has shifted towards a more equitable

distribution. The rest of the long-term insurance firms focus their attention on niche markets related to only one or two of the available business classes.

The nature of the long-term insurance industry enables the author to divide the whole defined market into six income/business classes. These different business or income classes create ambiguity regarding the correct market definition. The two methods of market definition, i.e. including all business classes in one market versus dividing the market into the different business classes, are compared with each other to determine the merit of each. The thesis therefore provides a detailed analysis of the concentration levels according to the single market definition as well as in the individual markets. To determine the direction of causality the single market method is used.

The purpose of the thesis is twofold. First it questions the status quo with regards to the application of the SCP paradigm as validation for the implementation of deconcentration measures. This is accomplished through the provision of a detailed analysis of argumentative developments regarding the manufacturing sector in South Africa. Second, the work deviates from the prior research in an attempt to apply the theory to the services industry and, more specifically, the long-term insurance sector of South Africa. To do this a comprehensive picture of the sector with regard to concentration as well as other elements of the SCP paradigm is provided.

## CHAPTER 2

### SCP PARADIGM - A THEORETICAL BACKGROUND

It is important that various theoretical issues be explained before the actual application of the theory could be implemented. The study of the microeconomic theory takes place within the framework of Industrial Economics.

Industrial economics explore the firm and its environment, of which a key element is the industry. The theoretical models constructed to explain the industry i.e. perfectly competitive markets consisting of many sellers that are not able to control the price, or monopoly models that constitute the opposite in terms of one strong firm that can set the price it desires is not necessarily a realistic portrait of real-world markets. The real world situation is characterised by a number of market forms, ranging from perfect competition, monopolistic competition, oligopoly and pure monopolies. An oligopoly refers to a market structure where a relatively small number of firms control the market. Monopolistic competition is characterised by a large number of buyers and sellers, easy entry and a differentiated product (Waldman and Jensen 1997:5).

The opportunity for these market structures to exhibit anti-competitive behaviour can best be explained through the theoretical models of perfect competition and the monopolist. In this chapter attention will be given to these aspects as well as the anti-competitive nature of these market structures and how they are regulated through the appropriate competition measures.

During the past number of decades, the study of Industrial Economics was characterised mainly by two rival approaches. The first is the Structure-Conduct-Performance approach, developed by Professors Mason and Bain in the 1940 and 50's (Waldman and Jensen 1997:5) and the second the Chicago School of economics with a reverse causality argument based on the efficiency hypothesis developed by Harold Demsetz. The development of these two viewpoints was of increasing importance and form the backbone of this chapter .

## **2.1 SCP - A HAT RACK?**

This section will emphasise the initial arguments and empirical work done by Mason (1939) and Bain in 1951 as well as the contemporary conclusions and interpretations of this work. The counter arguments of the rival schools of thought and the way in which this rivalry has manifested in present mindsets will be discussed as well.

### **2.1.1 The Early Structuralist's Hypothesis:**

The notion that there must be some sort of relationship between market structure and int. al. pricing and production behaviour of firms came to the fore as early as 1939. Edward Mason (1939:73) indicated that: "A monopoly position ... may lead to restrictions of output ... below that which is desirable or attainable with a greater degree of competition". This apparent forward causal notion evolved through a series of authors and articles into a powerful tool to justify de-concentration.

Bain (1951:293-323) co-initiated this frame of thought when he performed a statistical study of the American manufacturing industries from 1936 to 1940, attempting to clarify the relationship between the size of profits and the degree of seller concentration within these industries. The hypothesis Bain wanted to prove was: "That the average profit rate of firms in oligopolistic industries of high concentration will tend to be significantly larger than that of firms in less concentrated oligopolies or in industries of atomistic structure" (Bain 1951:294).

The basic argument set out by Bain determines that monopoly or effectively collusive oligopoly will lead to higher profit rates and prices than competition or imperfectly-or non-collusive oligopoly in the long run, given that demand, cost and entry conditions remain constant.

The method proposed to test the hypothesis was to identify a number of industries, determine their concentration as well as a measure of profitability for each of these industries. Industry is defined as "a concept of demand" or alternatively a group of outputs that are close substitutes for potential buyers (Bain 1951:298). This method was implemented for the interval 1936-1940 as the most complete data referred to 340

manufacturing industries in the Census of Manufacture for 1935. Bain, however, faced the difficult task of pairing product and industry as the concentration measures available in 1937 indicated concentration for the 3600 manufactured products constituting the particular industries at the time. This proved a time consuming exercise for example the firearms industry, which included the Census products pistols, rifles, and shotguns could be interpreted as either that there was a firearms industry in the theoretical sense, or there were pistol, rifle, and shotgun industries in the theoretical sense. A judgement call had to be made which entailed that each Census industry was viewed as comprising a theoretical industry or a complex of several theoretical industries.

Already it is apparent that data deficiencies at the time of Bains' testing created tremendous complications in contrast to the present availability of concentration measures and classification systems. The procedure employed to select his sample was based on the following steps. From the 340 initially appointed manufacturing industries those were selected for which profit data were available for the specified period. This left 152 industries of which concentration data were available for only 149. The 149 industries left were then screened to determine further rejections based on geographic market segmentation and product specialisation. They followed the Structure of the American Economy, a segregation of markets system, and chose the firms classified as diversified and serving a national market. A total of 83 industries were selected (Bain 1951:303).

The 83 firms were further scrutinised and evaluated on the basis of profit data. Only 49 industries with profit data for three or more of the firms included in the industry were selected. Final analysis of the industries left in the sample revealed further problems relating to narrowly defined industries, and 42 industries remained useful for hypothesis testing (Bain 1951:304). These 42 industries represented 335 firms for which profit data was acquired from the Exchange Commission's Survey of American Listed Corporations, 1936-40.

The specific profit measure chosen was the ratio of annual net profit after income taxes to net worth taken at the beginning of a year. Bain calculated this measure for



each firm over the specified period and referred to it as the firm annual profit rate.

From this two kinds of average rates were calculated:

- Firm average profit rate - an unweighted average of annual profit rates
- Industry average profit rate - a simple unweighted average rate of weighted average profit rates calculated by means of the summation of firm profit rates divided by the sum of firm net worths for the firms in the industry (Bain 1951:311).

The primary profit measure, Bain used to test the hypothesis, was the industry average profit rates (1936-40) for all of the 42 industries respectively and firm average profit rates for each of the component firms. The measure of industry concentration used in conjunction with the profit measures was the proportion of value product of the Census industry contributed by the first eight firms in 1935. Due to limitations Bain only used the 1935 concentration data, however post-war data indicated that industry concentration ratios remained fairly stable so that any error due to assumptions made on the 1935 data was small.

After comparing the 1935 concentration measures with the average profit rates (1936-40) no conclusive evidence was found for the existence of a simple linear relationship. According to the tabulated data a fairly high average level of profit rates were evident up to the 70 per cent concentration line, a much lower level between 70-and 30 per cent and then again high levels of profit rates below the 30 per cent level.

This lack of a linear downward decay of profit rates provided a stimulus for a more in depth analysis. It was found that in the selected sample, the average profit rate of 22 industries, in the industries where 70 per cent or more of the product was controlled by eight firms, was 12.1 per cent. For 20 industries below the 70 per cent line it was 6.9 per cent (Bain 1951:314). Bain therefore concluded tentatively that industries with an eight firm concentration ratio above 70 per cent, for the indicated period, had significantly higher average profit rates than those below the 70 per cent concentration level (Bain 1951:314).

Further analysis regarding net worth of firms indicated that firms with a net worth in excess of 5 million dollars provided much higher profit rates if the firm was in a industry with an eight firm concentration ratio above 70 per cent. Firms with a net worth less than 5 million dollars did not seem to have any significant relationship with concentration. Thus according to Bain the smaller firms fared the same regardless of industry concentration. Bain however declared this association also as tentative and open to doubt (Bain 1951:320).

In the 1951 article Bain stated clearly that he would have liked to do more thorough testing on the possibility of determinants other than concentration that could explain the variation in profit rates. Regrettably insufficient data prohibited any extensive research. The interesting possibility that was incorporated namely absolute firm size as measured by means of assets or net worth revealed no significant association of firm profit rate to firm size (Bain 1951:322).

In conclusion Bain remarked that to a great extent the major hypothesis i.e. profit rates of firms in industries of high seller concentration should on average be larger than firms in industries with lower concentration, could be correct. This however is tentative and open for further verification (Bain 1951:324).

### **2.1.2 Contemporary Discussions and Development of the Hypothesis:**

The particular article by Bain played a crucial role in the development of a de-concentration argument and competition policy as such. Many economists after Bain used his article as basis for research and further interpretation.

According to Mason (1939), Bain (1951) and their followers there is a direct relationship between market structure, market conduct and market performance. These links are quite visible when one looks at perfectly competitive markets. In a market consisting of a structure with many buyers and sellers, the result is efficient market performance with price equalling marginal cost, inefficient firms driven from the market place and long run economic profits equal to zero (Waldman and Jensen 1997:6). In actual fact the essence of the approach could best be described through the interactions between the different dimensions, structure, conduct and performance.

Bain defined the industry structure as “those characteristics of the organisation of a market that seems to exercise a strategic influence on the nature of competition and pricing” (Hemmasi, Massoud, Graf and Lee 1990:3). Caves (1980) as cited in Hemmassi et al (1990:3) defined competitive conduct as “the policies that participants adopt toward that market with regards to their price, that characteristics of their product, and other terms that influence market transactions”.

Through the attempt by Bain, and those who followed the SCP paradigm, to show causality between industrial structure, conduct and performance, attention was placed on the importance of concentration in an industry and the possible undesirable effects it might have on economic welfare. Concentration indicates inequality with regards to number and size of firms in a specific industry. Industrial Organisation theory suggests that rivalry intensifies and profitability erodes as the number of competitors increases and as firms become more equal in size (Hemmasi et al 1990:3). It is quite apparent that there must be a certain degree of causality in the mentioned dimensions of the SCP paradigm.

The essential question with regards to causality is how a change in one of the SCP dimensions would affect the other within the industry context. According to Smit (1999:6), industry could be viewed in terms of its structure (number of firms, conditions of entry, etc.) as lying between perfect competition and monopoly. The performance of that industry (profitability, technical progressiveness, etc.) lies between that of perfect competition and monopoly in a corresponding manner.

Mason's initial intention was that the causal link in the SCP-approach was to go from structure to conduct to performance (Waldman and Jensen 1997:6). This one-way relationship, as postulated by the early writers, was expanded in later years with the addition of backward causality against the initial flow. Waldman and Jensen (1997:6) explained this reverse flow argument through the following example. If one should look at the ready-to-eat cereal industry in America, it is quite apparent that the structure is an oligopoly with Kellogg, General Mills, General Foods and Quaker Oats dominant in the market. These four firms controlled 86% of the ready-to-eat cereal market in 1982. The market is characterised by a small number of sellers and product differentiation through the creation of many different brands.

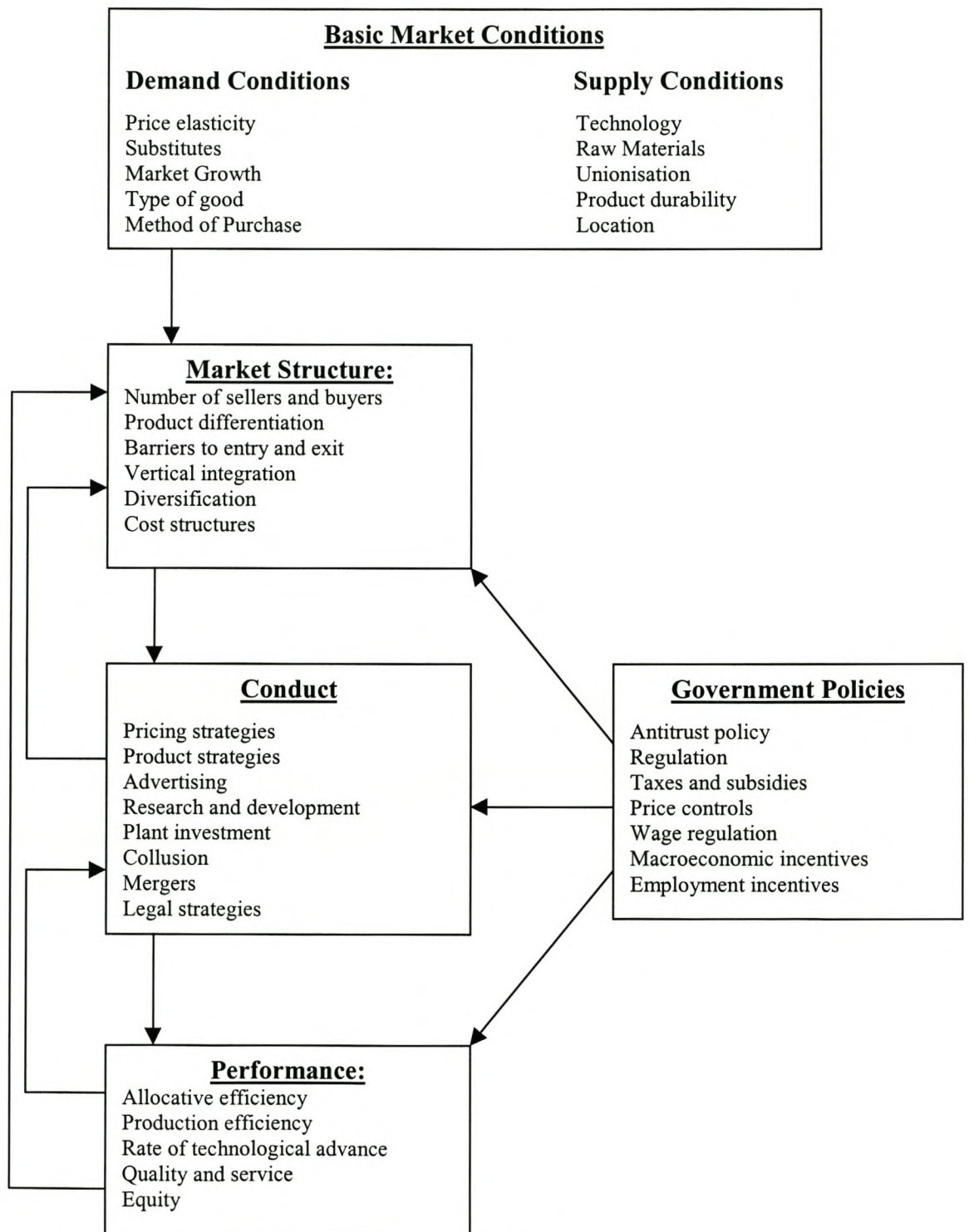


Figure 1: The Structure Conduct Performance paradigm  
 Source: Waldman and Jensen 1997:7

With regards to the proper conduct, product differentiation in the form of many different brands and a great deal of advertising played an important role. In 1987 for example Kellogg spent 16.5% of its sales revenue on advertising. This conduct led to performance characterised by prices being greater than marginal and average cost. Now, however, the backward causality comes into play. Performance means high profits, which could result in increased advertising and increased investment in product development. This could lead to performance having an influence on conduct. In addition to this, the high spending on advertising could make entry into the market more difficult, and reduce the number of sellers. In this way conduct may have an influence on structure (Waldman and Jensen 1997:6). Figure 1 illustrates these flows in the real-world markets.

Regarding figure 1, market structure is assumed to depend on basic conditions of demand as well as the supply side. In addition, market structures are influenced by government intervention by way of policy i.e. antitrust policy, which seeks to maintain market structures conducive to “good” conduct (Smit 1999:7). The significance of conduct in figure 1 is that it provides a valuable link between structure and performance. To go from conduct to performance, the essential question arises whether or not decisions of the firm enhance economic welfare. Performance can be measured in many ways. Typical performance indicators would be: allocative efficiency, X-efficiency etc. In the traditional SCP literature tremendous importance is placed on the extent to which firms deviate from allocative efficiency ideals.

The SCP paradigm thus provides a theoretical framework through which one can determine the level of adequacy with regards to suitable industry structure and accompanying performance. The original flow of causality, being:

Structure⇒Conduct⇒Performance,

made way for a more intricate perception of the SCP paradigm. Economists who accepted and used this strict view have been named Structuralists. In the 1970’s and 1980’s a great deal of theoretical development changed the traditional way of thinking of the Structuralists. Mainstream industrial economics came to accept a bi-directional relationship (figure 1) with performance and conduct having feedback effects that could result in concentration (Smit 1999:11). The rival approaches to the Structuralists’ line of thought, played a tremendous role in establishing the bi-

directional alternative as well as in establishing a counter argument regarding the application of competition policy based on the SCP paradigm.

### **2.1.3 Rival Developments to the SCP paradigm**

During the 1970's an opposite and anti-structuralist view came to prominence. This school of thought is in "fundamental disagreement with the traditional approach in industrial economics" (Smit 1999:14).

The backbone of the Chicago school is that the microeconomic model based on the notion of profit maximisation in perfectly competitive markets in long-run equilibrium is sufficient to explain real world occurrences (Smit 1999:14). The mainstream industrial economists (SCP-economists) are comfortable with the idea that imperfect competition is the best way to view industrial behaviour and contemplate that strong empirical evidence exists to support the notion of a positive relationship between monopoly power and profits (Waldman and Jensen 1997:8).

The Chicago school views a private monopoly, not supported by the government, as transitory. According to Reder (1971) as cited in Smit (1999:15): "Chicago concedes that monopoly is possible but contends that its presence is much more often alleged than confirmed, and receives reports of its appearance with considerable scepticism. When alleged monopolies are genuine, they are usually transitory, with freedom of entry working to eliminate their influence on prices and quantities within a fairly short time period".

The mainstream industrial economists also suggest that increased advertising will raise entry barriers and increase profits, i.e. the example of the ready-to-eat cereal mentioned above. The Chicago school uses empirical and theoretical evidence to prove that increased advertising leads to better information that results in lower prices (Waldman 1997:8). It is clear that the Chicago school chooses a path quite different from the one pursued by the mainstream economists. Proponents of the Chicago school argue that the competitive process itself guarantees efficient industry performance and that government itself is the only party that creates long-run monopoly distortions (Smit 1999:15). Singleton indicated that: " firms who gain their

monopoly position within a market on the basis of superior foresight and/or superior entrepreneurial ability should be protected from arbitrary antitrust action based solely on market share" (Smit 1999:15). The Chicago school is further of the opinion that any structural intervention must be rejected because it only serves the purpose of penalising the successful, and hinder them in their path of efficiency.

A pivotal paper by Harold Demsetz questioned the popular view of policy makers regarding monopolies and played an important part in enhancing the counter arguments against the Structuralists. According to Demsetz (1973:3) the superior efficiency of the monopolist resulting from managerial superiority, superior entrepreneurship and the lack of competitors to imitate quickly are the reasons for high profits. The reward for succeeding in your competitive endeavours i.e. providing better service to buyers, is often characterised by the formation of a monopoly. "To destroy such power when it arises may very well remove the incentive for progress" (Demsetz 1973:3).

Demsetz (1973:4-9) contemplated the inefficiency of anti-concentration policy. The importance of the effects of his arguments on the SCP-debate merits a short summary of his approach. His analysis was highly dependent upon the size of firms. Should large firms in a concentrated market earn higher rates of return than smaller firms, de-concentration measures would mean penalising the efficient. To the contrary de-concentration measures may have a profound effect on the reduction of collusion should small and large firms earn the same rates of return in a concentrated market.

Properly organising his data to prove the inefficiency of de-concentration measures was quite a challenge as a mere correlation between concentration and higher rates of return does not explain if efficiency or monopoly power is at work. According to Demsetz, effective collusion should be to the advantage of the smaller firms and therefore there should be a correlation between rates of return earned by smaller firms and the degree to which the industry is concentrated. Efficiency related concentration would mean a positive correlation between rate of return earned by large firms. This rate of return should be higher than the return earned by smaller firms.

Demsetz used data on 1963 rates of return and divided it into categories based on the size of a firm and the concentration of 95 three digit manufacturing industries. According to his data there was no evident relationship between concentration and collusion. However a positive relationship between the level of concentration and the rate of return earned by the largest firms was apparent. Demsetz therefore was not very optimistic about the beneficial effects of de-concentration policies. It would appear that the higher rates of return of larger firms are the result of lower average costs and a proportionately larger fraction of industry output which produces a higher return.

In conclusion Demsetz again states his unambiguous belief that larger firms get penalised via a system of anti-monopoly public policy for its apparent superiority. May it be that the de-concentration policy effectively eroded collusive practices it could have been applauded, however it appears that to the detriment of large firms, de-concentration measures only penalise superior efficiency manifesting in lower costs and increased production.

The debate between the mainstream industrial economists and the Chicago school of thought has been extremely important for positive developments in the field of Industrial Organisation. Even though some of the elements of the Chicagoans have been accepted, the principal Chicago positions continue to be rejected by orthodox industrial economists (Smit 1999:16).

Over the past 15 years or so a good deal more consensus has developed between economists that specialise in the field of industrial economics. The basis for much of this consensus is due to the application of game theory to models of oligopoly behaviour (Waldman and Jensen 1997:8). Even though these game-theoretic models of imperfectly competitive markets have displaced the SCP model (as mainstream paradigm), one still finds the SCP paradigm featuring strongly in the background. Its function changed to one of being an analytical tool with which the analyst can focus his/her attention on a common set of crucial issues (Smit 1999:16). "It provides a general framework for assimilating the contributions and proffered answers of the various approaches on key issues, rather than a strict model on which policy is to be based" (Smit 1999:16).



According to Reid cited in Smit (1999:17), before one turns to an alternative theory, one must take into account that the SCP-approach is enormously flexible, and in some way or another can accommodate elements of any of the other approaches. Scherer and Ross, cited in Smit (1999:17), point to the SCP-approach as a kind of a “hat-rack” in the sense that it is so useful for organising relevant theories and facts. To be able to utilise the “hat rack” properly a good understanding of the relevant theories is required.

## **2.2 THE DETERMINANTS OF THE SCP PARADIGM**

To be able to comprehend the SCP paradigm and the controversy surrounding it, a clear understanding of the relevant determinants, calculations and interpretations is essential. This section will place the emphasis on the theory needed and will be structured according to Figure 1 (page 10).

### **2.2.1 Market Structure**

‘Structure’ is a term that is used quite loosely in industrial economics. Where it is defined, it covers a variety of different characteristics relating to both individual firms and the relationship between firms (Devine 1979:27). This section on ‘structure’ refers to ‘market structure’ and not ‘industrial structure’. ‘Industrial structure’ refers to the pattern of transactions between individual industries or between groups of related industries. ‘Market structure’, on the other hand, refers to seller and buyer concentration, height of entry barriers and the degree of product differentiation within individual markets (Devine 1979:27)).

To be able to indicate the concentration levels with regard to a particular industry, it is important to define the market correctly. The correct market definition and market share calculations requires that all competitors in that market are correctly identified and all non-competitors are excluded.

#### **2.2.1.1 Defining the relevant market**

In order to identify competitors, substitutability with regards to consumers and producers should be taken into account. If two products are being used for similar purposes by consumers, the manufacturers of these goods could be regarded as competitors. In the same way, if two goods are produced using similar production processes, then the producers are competitors. If too few firms are included in the market definition, it could lead to an overstatement of market power. If too many firms are included and the definition of the market is too broad, it could lead to measures of market power that are biased downward.

In both of the above-mentioned cases, the reported measures of market power are not very useful for the purposes of prediction or evaluation of performance (Waldman *et al.*, 1997:84). The USA uses a system called the Standard Industrial Classification (SIC) to classify the output of manufacturing firms. The system is based on the use of numerical codes to define markets. The broadest level, the two-digit level, is used to identify the major industry group. The two-digit group is then subdivided into three-digit industry groups, and the subdividing continues up to a seven-digit level, the product. Table 1 shows an example of the SIC divisions.

*Table 1: An example of SIC categories*

SIC Code	Designation	Name
20	Major industry group	Food and kindred products
208	Industry Group	Beverages
2082	Product Group or Industry	Malt Beverages
20822	Product Class	Bottled beer and ale case goods
2082224	Product	Beer: Returnable bottles (12 oz.)

*Source: Waldman et al. 1997:86*

The SIC system is not a perfect system and tends to emphasise producer substitutability more heavily than consumer substitutability, which leads to wrong market definitions (Waldman 1997:86). An American example where industry pairs are too narrowly defined is glass containers (3221) and metal cans (3411). In this instance the products compete with each other in many uses, yet the manufactures are classified as being in non-competitive industries. This leads to the overstatement of the actual market concentration.

Due to the complexities accompanying the classification of different industries in different countries, especially where a firm produces a variety of products and may therefore belong to more than one industry, it is not surprising that the United Nations constructed an International Standard Industrial Classification (ISIC) system to make international comparisons of SIC systems more accurate (Devine 1979:30). The South African SIC system, devised by Statistics South Africa, is based on the

International Standard Industrial Classification of All Economic Activities published by the Statistical Office of the United Nations (Bureau of Market Research Report 1997:1). The SIC covers all economic activities and attributes the following codes to the major divisions (Bureau of Market Research Report 1997:2):

- 0 = Private households, ex-territorial organisations, representatives of foreign governments and other activities not adequately defined.
- 1 = Agriculture, forestry, hunting and fishing.
- 2 = Mining and quarrying.
- 3 = Manufacturing.
- 4 = Electricity, gas and water supply.
- 5 = Construction.
- 6 = Wholesale and retail trade; repair of motor vehicles, motor cycles and personal and household goods; hotels and restaurants.
- 7 = Transport, storage and communication.
- 8 = Community, social and personal services.

The SIC is aimed at classifying the economic activity, which in turn is determined by the products produced and the services rendered. The main activity of an establishment should be determined by value added, but in practice this is not easy to determine, so the main activity of an establishment is determined from gross income earned from the sale of the products or services concerned (Bureau of Market Research Report 1997:3).

If the definition of a relevant product market according to a well established classification system provides ample room for wrong interpretations it is not difficult to comprehend the challenges that face researchers in other sectors i.e. the services sector. This process will be discussed and elaborated on in Chapter 3 by defining a relevant product - and geographic market for the long-term insurance industry.

### 2.2.1.2 Market Concentration

Concentration does not only refer to actions by firms in individual markets, but also to actions taken by firms in aggregate markets. These actions are termed aggregate concentration. Statistics in this regard measure the role that large companies play in the economy as a whole (Waldman *et al.* 1997:77).

The concerns of policymakers with regards to economy-wide concentration is understandable in the light of possible political influence and contention for legislative favours through the billion dollar profit bargaining power of the largest firms. According to studies done by Salamon and Siegfried (1977), it was found that large firms have a statistically significant ability to avoid corporate income tax (Waldman *et al.* 1997:77). Another reason policymakers guard against aggregate concentration is due to the possible link that exists between aggregate and market concentration. Even though it is not often the case, there are quite a number of examples referring to the American market, which include General Motors, IBM and General Electric (Waldman *et al.* 1997:77).

For the purpose of this paper the main focus, however, is on individual markets due to concerns about monopoly or market power. Policymakers focus more often on individual markets than on aggregate markets because of a firm's ability to set prices above marginal cost, which leads to a misallocation of resources. This form of allocative inefficiency is one of the main reasons for concern amongst economists and policy makers with regards to firms that have market power. The concerns of policymakers regarding competitiveness in markets come strongly to the fore in a concentrated market. Therefore, to determine the level of concentration in individual markets, a range of measures were devised. These measures will be discussed in the following paragraphs.

A feasible measure of seller concentration basically measures the number of firms in an industry. The concentration levels (number of firms) in an industry is quite useful in extreme cases of monopoly and perfect competition, but when it comes to a couple of firms, an oligopoly for instance, a measure of concentration that also reflects market share is desirable (Waldman *et al.* 1997:82).

Suppose that in an industry each firm has an equal market share of 20%. In another industry suppose one firm has a market share of 80% and the others have market shares of 5% each. It is rather obvious that pricing strategies will differ in these two industries, and therefore a good measure of concentration that accounts for the inequality in market shares is important (Waldman *et al.* 1997:82).

There are several measures that take both the number of firms and the distribution of market shares into consideration. These measures, referred to *inter alia* as absolute, relative and summary measures, are used internationally to calculate concentration levels in industries. The importance of these concentration levels will be emphasised in this thesis.

The first is the n-firm concentration ratio, which gives an indication of the market share of the n largest firms in the market (Ruffin 1992:374). Typical values for n are 4, 8 and 20 (Waldman *et al.* 1997:82). This means that the four-firm concentration ratio (CR4) would be the sum of the market shares of the four largest firms in the industry. The measure for market size most commonly used is sales, but there are instances where value added or employment levels are used (Waldman *et al.* 1997:82). In a perfectly competitive industry the concentration ratio would equal 0, as opposed to a monopoly, where the concentration ratio would be 100.

There are, however, some problems with regards to the use of n-firm concentration ratios. Take two industries, for example, industry A, where the market shares of the eight largest industries are equal at 10% each, and industry B, where the market shares of the eight largest firms are made up as follow: 20, 20, 5, 5, 2.5, 2.5, 2.5 and 2.5%. The CR4 for industry A is 40% and the CR4 for industry B 50%. By contrast the CR8 indicates that industry A is more concentrated at 80% than industry B at 60%. These limitations of the n-firm concentration ratio method must be understood (Waldman *et al.* 1997:82).

This method looks at a specific number of the largest firms in an industry and the specific market shares held by these large firms. Any change in market share outside the largest firms will therefore not affect the concentration ratio. Other limitations are that changes in market share amongst the largest firms will not be reflected in the

concentration ratio, and neither will it tell anything of the way in which the largest firms' market shares are constituted within the concentration ratio (Waldman *et al.* 1997:82). According to Ruffin (1992:374), the n-firm concentration ratio method could be criticised based upon the following:

- Limits of the concentration ratio: It is an imperfect guide to the extent of monopoly power for three reasons. First, it does not reflect competition from foreign producers or substitute products domestically. Second, concentration ratios may be very small, but each firm in a particular industry may have virtual monopoly in the local geographic market, for example, local newspapers. Lastly, concentration ratios do not measure potential competition.
- Difficulties of measuring profits: The differences between accounting profits and economic profits cause measured profit rates to be unreliable with regards to monopoly power. Historical costs and opportunity costs may differ with regard to the evaluation of assets.
- High profits need not mean monopoly power: According to Harold Demsetz, firms that earn higher than average profits are normally quite efficient and the high profits could not be accredited to monopoly power but rather lower costs.

*Table 2: Concentration standards for manufacturing industries*

% of market occupied by the first four firms	% of market occupied by the first eight firms	Degree of concentration
75% or more	90% or more	Very high
65-75%	85-90%	High
50-65%	70-85%	Moderately high
35-50%	45-70%	Moderately Low
under 35%	under 45%	Low

*Source: Reekie 1989:46*

There are, however, certain pitfalls associated with the common concentration ratio measure, e.g. not revealing information on the constitution of market shares in the "tail" of firms measured or of the firms in the concentrated "head" of firms measured.

A means of overcoming these difficulties is through the use of cumulative share curves (Reekie 1989:45). To assist in setting up these cumulative curves, Bain laid down approximate standards for concentration in manufacturing industries. Table 2 and Figure 2 illustrate these measures.

In Figure 2 three hypothetical cumulative curves are shown with the zone of moderate concentration as set out by Bain. The curves represent the concentration ratios firm by firm from one through to the total number of firms in the industry. From Figure 2 it is clear that firms B and C are more concentrated than firm A, and that C is more concentrated than B up to about 14 firms. This means that in B the smaller firms have a larger share than in C, and there are fewer of them. Thus, A is not concentrated, C is highly concentrated and B is moderately concentrated up to about the twelve-firm level (Reekie 1989:47).

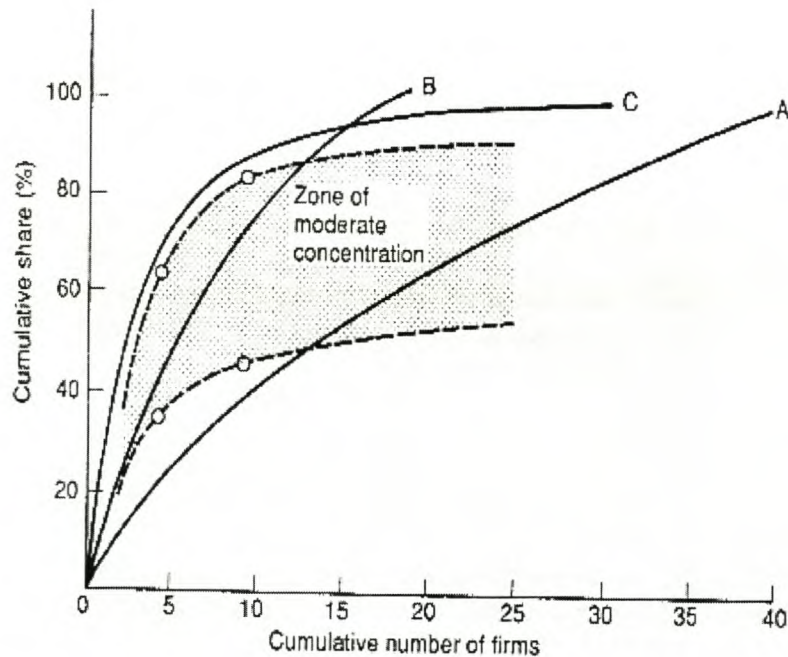


Figure 2: Cumulative concentration curves  
 Source: Reekie 1989:46



The more widely used concentration ratio measure in competition analysis is the Herfindahl-Hirschmann Index (HHI). This index is considered to be a better indicator of concentration because it takes into account both the number of firms and the inequality of market shares (Waldman *et al.* 1997:82). Thus, unlike the CR4, the HHI reflects the market shares of the top four firms as well as the composition of the market outside of the top four firms (Theron 1999:10). The HHI is defined as the sum of the squares of individual firms' market shares. This is expressed mathematically as:

$$\text{HHI} = S_1^2 + S_2^2 + S_3^2 + \dots + S_K^2 = \sum S_i^2$$

where K is the number of firms in the industry (Waldman *et al.* 1997:83). Originally the HHI used market shares, but more recently it became more common to use the HHI as percentages of market share instead (Waldman *et al.* 1997:83). With this in mind, the HHI approximates 0 for a perfectly competitive industry and equals 10 000 for a monopoly. In general the more firms there are in an industry, the lower the value of the HHI. This could be understood as follows: in an industry with N firms of equal size, the value of the HHI is 10 000/N. The value of N is referred to as the numbers equivalent (Waldman 1997:83).

An industry with four firms of equal size has an HHI of 2500. According to the American Merger Guidelines (1992), a market with a HHI of between 0 and 1000 is considered to be not unconcentrated. Any mergers that take place in such unconcentrated markets are considered to have no adverse competitive effects and will not require any analysis<sup>1</sup>. A post-merger HHI of between 1000 and 1800 is considered moderately concentrated, and above 1800 it is considered to be a concentrated market<sup>2</sup>.

The numbers equivalent is sometimes used to give some insight into a particular value of the HHI. The numbers equivalent for an HHI of 1000 would be 10 (N = 10

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<sup>1</sup> The change in HHI =  $(S_1 + S_2)^2 - (S_1)^2 - (S_2)^2 = 2S_1S_2$ , if a merger between the only two companies in an industry takes place.

<sup>2</sup> This matter will be discussed in more detail on page 30.

000/1000 = 10). One could conclude that a market with 10 firms of equal size will have an HHI of 1000. As the market share of a given number of firms get less equal, the HHI increases. Table 3 illustrates the advantages of the HHI index over the concentration ratio, as well as the significance of a higher HHI reading in terms of inequality in the market.

*Table 3: Calculation of CR4 and HHI for two hypothetical industries*

Market Share	Industry A	Industry B
Firm 1	30	70
Firm 2	25	10
Firm 3	20	5
Firm 4	15	5
Firm 5	4	4
Firm 6	3	3
Firm 7	2	2
Firm 8	1	1
CR4	90	90
HHI	2180	5080
Number Equivalent	4.59	1.97

*Source: Waldman 1997:83*

The CR4 of both hypothetical industries is 90, but the higher HHI of industry B clearly shows that greater inequality exists within the market shares amongst the four largest firms compared to industry A. It is important to note that data from the four largest companies are taken into account when calculating CR4, and data from all the firms are used to calculate HHI. It is apparent that HHI is very sensitive to market shares of the largest firms ( $50^2=2500$ ;  $25^2+25^2= 1250$ ).

The Herfindahl-Hirschmann Index could also be referred to as a summary measure due to the fact that it takes all market members into account. There are other summary indexes as well, i.e. the Hovarth Index (HI) and the Rosenbluth index (RI) (Theron 1999:11). The Rosenbluth index could be defined as:

$$R = \left\{ 2 \sum_{i=1}^n (i.m_s) - 1 \right\}^{-1}$$

where  $ms_i$  is the market share of the  $i^{\text{th}}$  firm and  $n$  is the number of firms. This means  $R$  is the reciprocal of the expected firm rank in the industry, and ranges from a minimum of  $1/n$  for  $n$  firms of equal size to a maximum of 1 (Leach 1992b:149). The index is directly related to inequality of firm size and inversely related to the number of firms. According to Leach (1992b:149), the Rosenbluth index is a simple positive function of the Gini-coefficient:

$$R = \{n(1 - G)\}^{-1}$$

The Gini-coefficient is referred to as a relative measure and measures the distribution of market shares within an industry (Leach 1992a:388). It is essential that the manipulation to calculate the Gini-coefficient is understood. Making  $G$  the subject of the equation yields the following:

$$G = 1 - 1/Rn$$

According to this formula,  $n$  (the number of firms included in an industry) plays a crucial role in determining the value of  $G$ . This particular conclusion plays an important role regarding the utilisation of the Gini-coefficient in industry analysis and will be referred to again in Chapter 3.

As indicated, the Hovarth Index is another summary measure that could be used. The formula for the calculation of the Hovarth Index is :

$$ms_i + \sum_{j=2}^n ms_j^2 [1 + (1 - ms_i)]$$

It is the sum of the market share of the leading firm and an HHI of the remaining firms “reinforced by a multiplier reflecting the proportional size of the rest of the industry” (Leach 1997:16).

According to Fourie (1996:104), the Herfindahl-Hirschmann index appears to be the most widely used summary index in the available literature. He refers to the Hovarth index as useful for gauging a trend; however, it is seldom used in concentration analysis. The Rosenbluth index is also used less frequently in literature and may be of particular use when analysing industries with small numbers (less than 10) of firms (Fourie 1996:116). The CR4 concentration ratio is the superior absolute measure and the Gini-coefficient is the dominant relative measure.

Fourie made the above remarks as part of an analysis of concentration data provided by various researchers for the South African manufacturing sector. In Chapter 3 the author will return to the manufacturing sector as front-runner to the study on the long-term insurance industry. At present, however, commenting on Fourie's analysis will provide a better understanding of the application of the concentration indices as well as the level of concentration in the manufacturing sector as indicator of concentration levels in the broader economy. Some of the concepts referred to will also be discussed in further detail in the coming sections.

According to a study done by the Mouton Commission and Du Plessis on concentration levels in the manufacturing sector of South Africa during the 1970s, it was found that in comparison to other countries, i.e. Italy, West Germany, and Britain, a much higher average concentration level was present (Fourie 1996:99). Fourie and Smit (1989:242) updated that study, ruled against the use of absolute measures due to the lack of statistical data and decided on using a relative measure, i.e. the Gini-coefficient. Their finding was that concentration in the South African manufacturing sector was high and on the increase.

Leach (1992a:386) criticised Smit and Fourie on their assumption that insufficient data were available to calculate absolute measures. He stresses the fact that the choice of relevant measure will greatly affect the outcome of an analysis and therefore compared relative, absolute and summary measures. As absolute measure Leach used a less popular measure, the occupancy count – the number of firms accounting for a given percent of industry size (Leach 1992a:387). His results indicated contrary to the Gini-coefficient a decrease in 18 out of the 26 industries for the Rosenbluth index and a decrease in concentration for 16 industries for the occupancy count.

The explanation provided for this contrasting results is the substantial increase in the number of firms in the relevant industries over the measured periods. The increase in the 80% occupancy count, however, was not statistically significant and therefore did not display any trend in concentration. Even though there have been claims that the Rosenbluth index is over-sensitive to the number of firms, Leach states: "Thus concentration decreases because the increase in the number of firms more than offsets rising inequality as measured by the Gini-coefficient" (Leach 1992a:390).

Fourie (1996:102) comments on Leach's results by pointing out that he neglects to interpret the absolute level of the Rosenbluth index with regards to the level of concentration, rather than using it just to refute the upward trend indicated by the Gini-coefficient. Interpreting the Rosenbluth index, however, provides a substantial challenge and, according to Fourie (1996:102), might seem low when compared to the Gini-coefficient, which can be misleading.

Even though Rosenbluth values can range between 0 and 1, if Leach's formula ( $R=1/n(1-G)$ ) is taken into account, as far as the manufacturing industry – where the smallest 3-digit industry<sup>3</sup> has approximately 30 firms – is concerned, a maximum value of 0.15-0.20 would be more appropriate. This compares to approximate Gini values of 0.6-0.8 (Fourie 1996:103).

Fourie (1996:103) further indicates that Leach's bold assumption on the increase of the firms offsetting the inequality only highlights the main weakness of the Rosenbluth index. The n-value plays a crucial role in this weakness as the Rosenbluth index is over-sensitive to any increase in the number of firms and may therefore nullify any possible increases in concentration of incumbent firms with substantial market share over a period due to the increase of fringe firms with negligible market share. Fourie therefore gives a strong indication of the Rosenbluth index being misleading, especially regarding trends (Fourie 1996:103).

Fourie (1996:106) calculated various concentration indexes for the period 1972-1988 and reconfirmed the Fourie and Smit (1989) results, i.e. that the concentration levels of the South African manufacturing sector are high and increasing moderately. The importance of using various concentration measures and incorporating their limitations when undertaking a particular study transpires from Fourie's arguments. This remark is duly noted and will be applied in the study of the long-term insurance industry.

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<sup>3</sup> The SIC and ISIC codes are discussed in section 2.2.1.1

The importance of understanding and using concentration measures comes to the fore in practical application. The Competition Commission<sup>4</sup> uses the four-firm concentration ratio as absolute measure and the Herfindahl-Hirschmann index as summary measure to evaluate the impact of proposed mergers on concentration levels (Competition Tribunal 2000:16). Due to existing high levels of concentration in the South African economy and the anti-competitive behaviour associated with it, the appropriate application of concentration indices is not only advisable but of the utmost importance. To illustrate the above the author has included an example from the South African petroleum industry.

The case of the Competition Commission versus Trident Logistics (Proprietary) Limited illustrates the role of market concentration and the problems associated with high levels of concentration (Competition Tribunal 2000:46-48). The functions of the Competition Commission will be discussed later, so at this stage the only important issues are those regarding the use of the HHI index and the n-firm concentration ratios in determining the suitability of the proposed merger. According to the proposal BP, Caltex and Shell in South Africa wanted to form a supply and distribution joint venture under the name of Trident Logistics.

The Competition Commission, however, did not agree that the proposed merger would be in the best interest of all the affected parties and that such a transaction might give BP, Shell and Caltex an unfair advantage over the rest of the players in the liquid fuels industry. The Competition Commission provided Tables 4 and 5 in defence of their case against the merger.

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<sup>4</sup> The South African competition authorities will be discussed in section 2.2.4.2. At present it will suffice to know that the Competition Commission is mainly an investigative body appointed under the Competition Act of 1998 to ensure fairness by evaluating proposed mergers and by investigating complaints of practices prohibited under the Act of 1998.

*Table 4: Market concentrations in regard to storage and handling at depots*

<b>Company</b>	<b>Market Share</b>	<b>Market Concentration Levels</b>
BP	16	256
Caltex	24.70	610.09
Shell	20.90	436.81
Engen	22.24	494.62
Total	10.95	119.90
Sasol, Petronet	5.20	27.04
BEE Companies	0	0
<b>Total</b>	100%	
<b>Pre-Merger HHI Concentration Levels</b>		<b>1944.46</b>
<b>Delta</b>		<b>2491.66</b>
<b>Post-Merger HHI Concentration Levels</b>		<b>4436.12</b>

*Source: Competition Tribunal, Annexure XVIII, 2000:16*

*Table 5: Market Concentrations in regard to annual capacity of conventional refineries.*

<b>Refinery Capacity</b>	<b>Market Share</b>	<b>Market Concentration Levels</b>
SAPREF (Shell and BP)	38.35%	1470.72
CALREF (Caltex)	20.68%	427.66
ENREF (Engen)	22.56%	508.95
NATREF (Sasol and Total)	18.41%	338.93
Total Capacity	100%	
<b>Pre-HHI Merger Concentration Levels</b>		<b>2764.26</b>
<b>Delta</b>		<b>1586.21</b>
<b>Post-Merger HHI Concentration Levels</b>		<b>4332.47</b>

*Source: Competition Tribunal, Annexure XVIII, 2000:17*

It is quite clear from the information in Tables 4 and 5 that very high levels of concentration are present in the distribution side of the liquid fuels industry. Both Tables indicate a pre-merger HHI of above 1800. In Table 5 the CR3 after merging will be about 95%. The proposed merger showed signs of horizontal restrictive practices in an extremely concentrated industry. Due to overwhelming opposition to the suggested merger, all interested parties withdrew and the merger did not take place.

The Competition Commission evaluates horizontal mergers according to the general standards as set out by the US Merger Guidelines (2001:11). Post-merger market concentration and the increase resulting from the merger will be considered in the following ways:

- A post-merger HHI below 1000 is viewed as being unconcentrated and is unlikely to have an adverse effect on competition.
- A post-merger HHI between 1000 and 1800 is viewed as moderately concentrated. Mergers in these markets require further definition. A merger that leads to an increase in HHI of less than a hundred does not require further analysis; however, mergers that increase the HHI in moderately concentrated markets with more than a 100 will raise concerns about competition.
- A post-merger HHI above 1800: markets in this region are regarded as being highly concentrated; however, mergers in these markets that cause a post-merger increase in HHI of less than 50 do not need further analysis. Mergers increasing HHI by more 50 will raise competitive concerns, and an increase over a hundred will more than likely create market power.

Bain (1951:323) regretted the fact that he was unable to test for the relation between profits and other characteristics of market structure. “The condition of entry to the industry is perhaps the most prominent other characteristic” (Bain 1951:323). Figure 1 also indicates other elements included in market structure and it is therefore imperative to include some discussion on some of these elements.



### 2.2.1.3 Barriers to entry

Since a more elaborate discussion on monopolies will follow under the investigation of conduct, a short description of a monopoly will be given now. For a pure monopoly to be able to exist, three conditions need to be satisfied:

- Only one seller in a market for homogenous goods with no close substitutes;
- Pure monopolies are free from external constraints and can maximise profits;
- Barriers to entry protect the seller from competition by new firms and can thus act as a price maker in the market (Ruffin 1992:295).

It is thus quite clear that barriers to entry can be negative with regards to establishing unfair advantages in a particular market. The exact manner through which barriers to entry function requires further attention.

According to Waldman and Jensen (1997:99), a barrier to entry is any factor that prevents instant entry. This definition is not very practical due to the fact that even under conditions of perfect competition a firm can make profits in the short run. Long-run profits, however, encourage entry and we therefore consider long-run effects regarding barriers to entry. Bain referred to entry barriers as impediments preventing new firms from earning the same levels of profit as incumbents did before entry. Stigler defined barriers to entry as “a cost of producing which must be borne by firms which seek to enter an industry but is not borne by firms already in the industry” (Waldman 1997:100).

Different viewpoints exist on the basis of the relevance of economies of scale as justifiable barriers to entry. For the purposes of this paper the determinants of barriers to entry, as set out by Bains, will be covered. It is important to notice that Bain considered static barriers to entry, which involve mostly cost differences between incumbents and potential entrants. The following barriers are important:

- Economies of scale:

Economies of scale exist when long-run average cost decreases as the volume of output increase (Waldman *et al.* 1997:101). When one looks at the classical definition of a natural monopoly, it is quite easy to notice the role of economies of scale. Figure 3 illustrates the declining long-run average cost curve.

In the case of a natural monopoly the average cost declines with increases in the volume of output. This is normally associated with industries requiring a substantial initial capital cost, e.g. power plant. When looking at Figures 3 and 4, i.e. the hypothetical long-run average cost curve, it is important to identify the minimum efficient scale (MES) in order to correctly understand the significance of economies of scale as a barrier to entry.

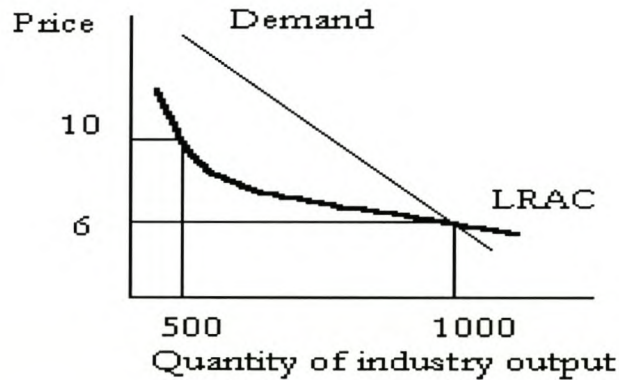


Figure 3: Natural Monopoly  
Source: Ruffin 1992:297

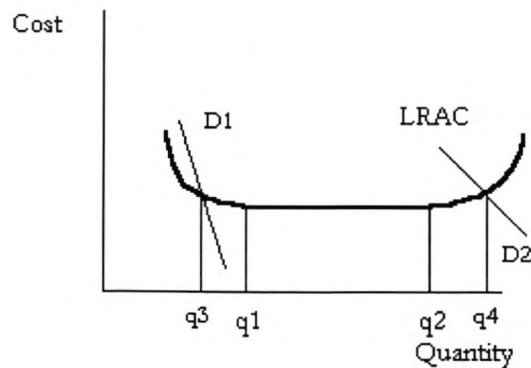


Figure 4: Hypothetical LRAC  
Source: Waldman and Jensen 1997:101)

In Figure 4 between  $q_1$  and  $q_2$  the unit cost remains the same, and after  $q_2$  the average cost increases with output. Depending on the demand curve for the particular industry, economies of scale can act as a barrier to entry in the sense that demand only allows a certain number of MES plants. The assumption made here is that incumbent firms already have MES plants. In the case of D1 in Figure 4 demand is sufficiently low that one firm can satisfy demand at the lowest average cost. At D2 (Figure 4) demand is high enough so that several firms could produce and sell output to minimise average cost. It is thus clear that economies of scale, in the case of D1, act as a barrier to entry, more so than in the case of D2 (Waldman *et al.* 1997:102).

Accompanying possible entry is the uncertainty as to what the reaction of incumbents will be. According to Bain incumbents will maintain pre-entry levels of production, which will lead to prices being driven down (below average cost) if the entrant also produces at MES. Considering substantial sunk costs accompanying entry, it becomes apparent that it will be difficult for potential entrants to enter a industry. As an elaboration on economies of scale, reference must be made to economies of scope.

Explained briefly, an economy of scope exists under the following condition:  $C(q_1, q_2) < C(q_1, q_0) + C(0, q_2)$ ;  $C$  indicates the cost function. This means that the cost accompanying the production of related products in one plant is much less than producing these products at separate plants (Waldman *et al.* 1997:109). So the cost saving is referred to as economies of scope. For example, General Motors in America lowers the cost by about 25% by means of combined production of large cars, small cars and trucks (Ruffin 1992:298). The cost savings protect multi-product manufacturing incumbents against entrance by means of high capital lay-out for these multi-product plants, hence making it difficult for potential entrants to rival their prices.

- Absolute cost advantages:

It is possible that due to certain factors an incumbent can have an absolute advantage over potential entrants and can produce at lower average cost for any

given level of output. It could be that the incumbent may control an important input, or may have sole access to superior technology (protected by patents), etc. There are a number of possible structural barriers to entry when one looks at absolute cost advantages, but there is not a lot of empirical evidence. The most apparent generalisation that can be made is that this barrier to entry is quite important in industries where patents are significant or where capital costs are high (Waldman *et al.* 1997:111).

- Capital costs:

Capital costs, in contrast to absolute cost advantages discussed above, are closely connected to economies of scale. The general assumption is that the larger the minimum efficient scale, the larger the amount of financial capital required to enter at the MES (Waldman *et al.* 1997:112). The connection with absolute cost advantage lies here. When new entrants require substantial financial capital to finance their entry into the market, economists identify three reasons why the entrant will pay more for borrowed money than an incumbent: risk, transaction cost and loan market imperfections (Waldman *et al.* 1997:112).

- Sunk Costs:

The discussion on the different elements of barriers to entry, especially with the following chapters in mind will not be complete without mentioning the sunk costs. Recent thinking in industrial economics indicates that if fixed costs can be retrieved, they do not act as a barrier to entry. Thus if the fixed cost cannot be retrieved, it is known as sunk cost, and the higher the proportion of sunk costs the larger are potential losses, and that in turn prompts new firms to think twice before entering a market (Ruffin 1992:299).

The above are but a few of the possible barriers to entry. In Chapter 3 entry analysis of the long-term insurance market devotes further attention to possible barriers.

2.2.1.4 Vertical integration:

Vertical integration refers to firms that organise their business so as to perform a substantial number of transactions internally. The advantage of such a move is that it limits transaction costs. As a matter of fact, in most of the cases where vertical integration is aimed at reducing transaction costs, it will have positive efficiency and welfare effects (Waldman *et al.* 1997:406). Theoretically, according to Waldman and Jensen (1997:406-420), vertical integration can impact on industry structure in the following way:

Case:	Wholesaler is:	Retailer is:
A	Competitive	Competitive
B	Competitive	Monopolist
C	Monopolist	Competitive
D	Monopolist	Monopolist

The question here is in which of these cases will vertical integration affect price and profits? Case A has no influence on price or profit due to the fact that price is equal to marginal cost. Figure 5 provides a graphic explanation with regards to case B.

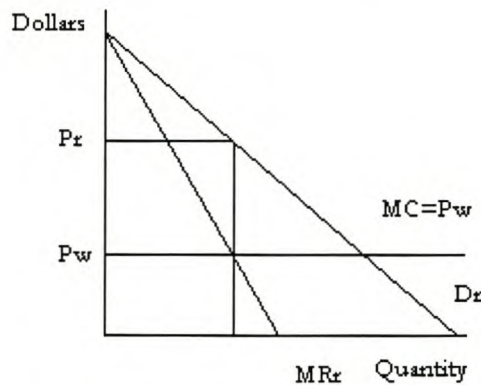


Figure 5: Competitive wholesaler, monopolist retailer  
 Source: Waldman and Jensen 1997:407

$D_r$  is the retail market demand curve. The wholesaler is competitive and therefore charges a price equal to marginal cost ( $MC=P_w$ ). Due to its monopolistic nature the retailer charges a profit maximising price  $P_r$ . In this case vertical integration will have no impact on price, because  $P_r$  will also be the price of the vertically integrated

firm. Case C is depicted in Figure 6. The retailer demand curve  $D_r$  is also the wholesaler (monopolist) demand curve, because the quantity demanded along the  $D_r$  curve represents the quantity of the good that retailers will sell at any given wholesale price. This means that the profit maximising price of the wholesaler will be  $P_w$  ( $MC_w=MR_w$ ). Clearly this means that the price of the retailer will be equal to its marginal cost, which is  $P_w$ . Vertical integration will thus not affect the price or profit in case C as well.

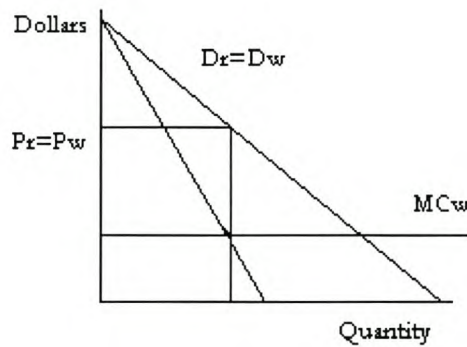


Figure 6: Monopolist wholesaler, competitive retailer  
Source: Waldman and Jensen 1997:408

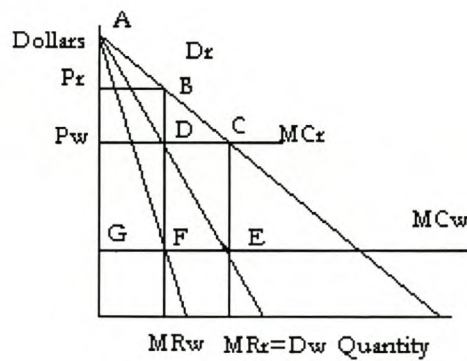


Figure 7: Monopolist wholesaler, monopolist retailer  
Source: Waldman and Jensen 1997:409

Case D provides a scenario where vertical integration in fact has a influence on price and profits. Figure 7 illustrates the situation. An important distinction in this case, however, is that the marginal revenue curve of the retailer is the demand curve of the wholesaler. Thus the demand curve of the wholesaler will be  $D_w = MR_r$ . The marginal revenue curve of the wholesaler is then  $MR_w$ , and will set profit maximising

price where  $MR_r = MC_w$  and thus charge a price  $P_w$ . The retailer now takes  $P_w$  as its marginal cost ( $MC_r$ ) and sets price where  $MC_r = MR_r$  and determines price  $P_r$ .

The wholesaler earns a profit equal to  $P_w DFG$  and the retailer earns a profit of  $P_r BDP_w$ . The consumer surplus equals triangle  $ABP_r$ . If the two firms were to integrate vertically, the firm would maximise profits by considering the internal marginal cost of the wholesale product to be  $MC_w$  and not  $P_w$ . This will result in the integrated firm charging a retail price of  $P_w$  and realising a profit of  $P_w CEG$ . The consumer surplus will increase from  $ABP_r$  to  $ACP_w$ . Therefore in this case public policy should do everything within its power to encourage the vertical integration. The effect that individual monopolies have on the final retail price could be referred to as double marginalisation. Vertical integration lessens this distortion effect.

Vertical integration can raise the capital costs as an attempt by incumbents to increase the costs for potential entrants. Exclusive dealing arrangements could be used, whereby a retailer agrees to carry only the manufacturer's products. Vertical integration can also be used by a firm to apply a price squeeze by increasing the price of inputs and decreasing the retail price of the finished good. The concept/theories of price settling will be examined in the section under conduct.

The significance of vertical integration under market structure is also apparent as increased vertical integration is likely to decrease the number of firms in an industry and will increase market concentration.

### **2.2.2 Conduct**

The next determinant of the SCP paradigm refers to conduct. Even though conduct is difficult to measure and for that reason gets omitted from the majority of SCP studies, otherwise known as the concentration-profits debate<sup>5</sup>, its importance as a valuable link in the SCP paradigm can not be underestimated. Studying conduct is of particular significance, especially regarding the pricing and product strategies of

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<sup>5</sup> The debate will be discussed in Chapter 3

firms. In actual fact the conduct of a firm extends as far as the amount of research and development, advertising and degree of co-operation amongst firms.

Different market forms have been defined as constituting various characteristics of real world phenomena i.e.

Perfect competition ⇔ Monopolistic Competition ⇔ Oligopoly ⇔ Monopolist

To understand the possibilities that exist with regard to the conduct of different market forms, a short theoretical background is needed.

#### 2.2.2.1 Market Structures - A theoretical background

To simplify it is best to study the perfect competitive model first. The underlying principles will facilitate the interpretation of the other market forms. The assumptions associated with the perfectly competitive model are:

- Large number of buyers and sellers;
- Homogeneous products;
- Perfect information;
- No transaction costs;
- Free entry and exit (Waldman *et al.* 1997:25).

According to the rule of profit-maximising, a firm will produce at the level of output where marginal revenue equals marginal cost. As long as a firm's marginal revenue is greater than its marginal cost, the firm can still increase profits by producing more units (Case and Fair 1999:197). This will go on until the firm produces at the point where  $MR = MC$ . In the case of a perfect competitive firm, marginal revenue will always be equal to marginal cost (Waldman *et al.* 1997:27). This characteristic of the perfectly competitive model indicates an efficient allocation of resources. This means that no possible reallocation of resources will make one market participant better off without hurting another.

Allocative efficiency requires that the marginal benefit from producing another unit of output equals marginal cost (Waldman *et al.* 1997:32). The fact that the price a



consumer pays is a representation of the value the consumers places on that unit, and that this is equal to the cost society incurred in producing that unit, ensures efficiency.

The perfectly competitive model also exhibits efficiency in production, which means that in the long run each firm is producing at the minimum point on its average cost curve. Another characteristic is that the perfectly competitive firm earns zero economic profits in the long run (Waldman *et al.* 1997:32). The characteristics of allocative and production efficiency represent a substantial part of the performance of a market form, in this case a perfectly competitive industry structure. As far as conduct is concerned, price – or rather the ability to set a price – determines the extent of efficiency or degree of performance. In the perfectly competitive industry firms are price takers; however, when it comes to monopolies and oligopolies the degree of autonomy with regards to price setting varies.

A monopoly is the industry, the sole producer of a product with no close substitutes. The demand curve of the monopolist, according to the assumption, slopes downward. The monopolist can choose where it wants to operate along the demand curve: high output and low prices, or low output and high prices. The goal for the monopolist is profit maximisation and therefore it will aim to function at the point where marginal revenue equals marginal cost. Unlike firms that function under conditions of perfect competition, marginal revenue for the monopolist does not equal price (Waldman *et al.* 1997:33).

The only way that a monopolist can sell an extra unit, bearing in mind that it is facing a downward sloping demand curve, is by lowering the price on all the units<sup>6</sup>. The monopolist gains revenue by selling the extra unit, but also loses revenue due to a lower price on the other units (Waldman *et al.* 1997:34). Figure 8 illustrates the trade-off graphically.

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<sup>6</sup> The assumption is made that the monopolist is not able to practise price discrimination.

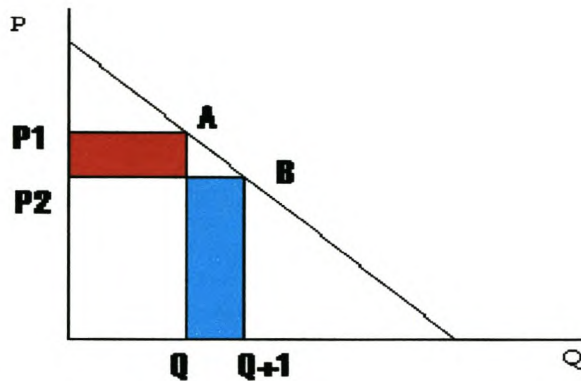


Figure 8: Changes in TR due to price cut  
Source: Waldman and Jensen 1997:34

The red area depicts the amount lost and the blue area depicts the amount gained. Marginal revenue is the sum of the two areas. It could be concluded from Figure 8 that marginal revenue for a monopoly is always less than price in the following manner:

$$MR = \frac{\Delta TR}{\Delta Q}$$

and because  $\Delta Q = 1$ ,  $MR = (P_2 \cdot Q_{+1}) - (P_1 \cdot Q)$

the conclusion is  $MR = P_2 - (P_1 \cdot Q)$  or  $MR < P$ .

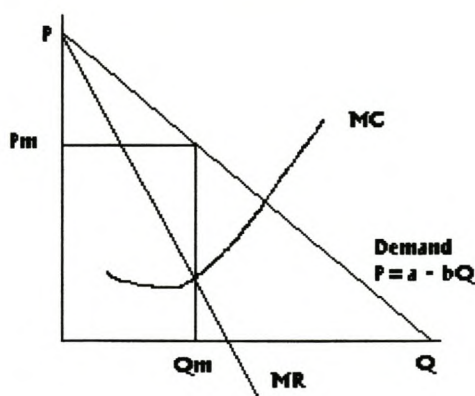


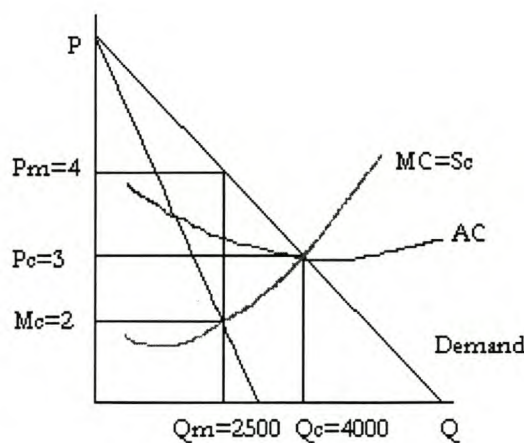
Figure 9: Profit maximising price and quantity for a monopolist  
Source: Waldman and Jensen 1997:35

Illustrated graphically, the marginal revenue curve lies everywhere below the market demand curve (Figure 9). Studying Figure 9 reveals that  $Q_m$ , the profit maximising

quantity ( $MR = MC$ ) of output has a corresponding price of  $P_m$ . Figure 9 further illustrates that the marginal revenue curve is sloped twice as steeply as the demand curve<sup>7</sup>. Take into account that the equation for the linear demand curve is  $P = a - bQ$  (Waldman *et al.* 1997:36).

It is now possible to examine the welfare implications in comparison to the perfectly competitive market. The perfectly competitive model serves as a good reference point because of its desirable properties in the long-run equilibrium. A comparison between the perfectly competitive model and the monopoly model could be justified to highlight the inefficiencies that accompany monopolies. These inefficiencies are manifested in all the imperfect competitive models.

The comparison can best be explained via the following example. Assume a perfectly competitive industry consisting of a large number of firms and production technology that exhibits constant returns to scale (average cost remains the same). Suppose now that this industry comes under the control of a single private monopolist. To be able to analyse the monopolist's decisions the derived graphs in Figure 10 must be considered



*Figure 10: Comparison of monopoly and perfect competition*  
 Source: Case and Fair 1999:310

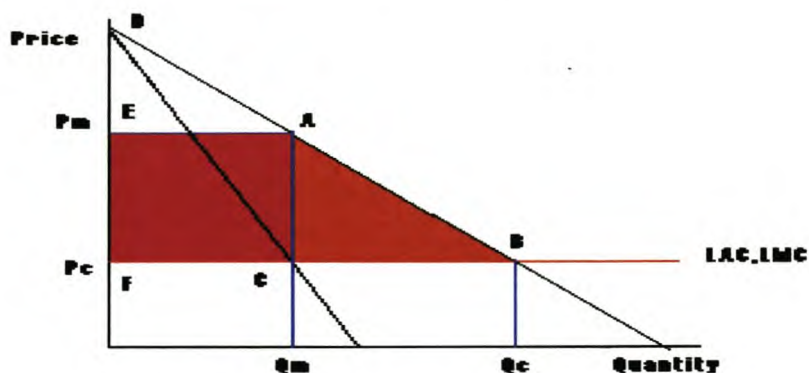
The marginal cost curve of the monopolist will be the horizontal sum of the marginal cost curves of the individual firms. Note that when the industry was organised

<sup>7</sup> From calculus,  $TR = (a-bQ)Q = aQ - bQ^2$  so  $dTR/dQ = a - 2bQ$

competitively, the market supply curve was the sum of the short-run marginal cost curves of the firms in the industry. The marginal cost curve of the monopolist is the same as the supply curve of the perfectly competitive industry. Figure 10 displays the restrictions in output and the higher prices charged by the monopoly in comparison with the perfectly competitive model (Case and Fair 1999:310).

For the competitive industry output would have been  $Q_c=4000$  and price would have been  $P_c=3$  (determined at intersection between  $S_c$  and demand curve). The monopolist, however, in its function as price maker and not price taker, can set a price at any price/quantity combination along the demand curve. At the point where marginal revenue intersects marginal cost there is profit maximisation and therefore price is determined at  $P_m=4$  at a quantity of  $Q_m=2500$  (Case and Fair 1999:310).

The social costs involved in a transition like the one explained above are already evident due to the fact that a monopoly increases price and lowers output. Firms with monopoly power set a price at such a level that price and social marginal benefit of the last unit produced exceed the private and social marginal cost of producing that last unit (Begg, Fischer and Dornbusch 1984:371).



*Figure 11 : The Social cost of monopoly*  
 Source: Begg et al. 1984:372

Figure 11 indicates the social cost involved with regard to a monopoly. Under perfect competition LMC (long-run marginal cost) is both the industry's long-run marginal cost curve and its supply curve. Assuming constant returns to scale, LMC is also the long-run average cost curve of the industry. Competitive equilibrium is at B, producing an output of  $Q_c$  at a price of  $P_c$ . If this competitive industry is taken over by a monopolist (assuming costs stay the same), the monopolist produces at  $Q_m$  at

price  $P_m$ . The area  $P_mACPC$  indicates the monopolist's profits from selling  $Q_m$  at a price higher than marginal and average cost.

The triangle  $ACB$  indicates the social burden as a result of monopoly power (Begg *et al.* 1984:372). This social burden or dead weight loss is the result of a misallocation of resources (inefficient allocation). The consumer surplus under perfect competition is shown by triangle  $DBF$ . Consumer surplus is the difference between the maximum amount consumers are willing to pay for certain goods and the amount they actually pay (Waldman *et al.* 1997:32).

Under a monopoly the consumer surplus is a much smaller triangle  $DEA$  (output equals  $Q_m$  and price equals  $P_m$ ). The difference between  $DBF$  and  $DEA$  can be broken into two areas: rectangle  $EACF$  and triangle  $ABC$ . Rectangle  $EACF$  (monopoly profits) represents a transfer from consumers of the goods to monopoly owners. Thus it is not a loss to society, but there may be certain issues with regards to this transfer concerning the distribution of income. The important issue at question, however, is the triangle  $ABC$ , which represents a loss of social welfare and serve as a measure of the misallocation of resources from a monopoly. This happens because marginal cost for the monopoly is less than the price of the good. The consumers will be willing to pay more for an additional unit of the good than it would cost society to produce that good, yet the monopolist does not produce it (Waldman *et al.* 1997:38).

By adding together the dead-weight burden triangles for all industries in which marginal cost and marginal revenue is less than price, the social cost of monopoly power for the whole economy can be obtained (Begg *et al.* 1984:372). There is a great deal of controversy and debate as to whether the social burden of monopoly power is sufficient to deem regulatory action from governmental powers necessary. Professor George Stigler argued: "Economists might serve a more useful purpose if they fought fires or termites instead of monopoly" (Begg *et al.* 1989:372). In contrast, Professor F.M Scherer has stated: "... in the United States the social cost of monopoly is large enough to treat every family in the land to a steak dinner at a good restaurant" (Begg *et al.* 1989:372).

The reason for this disagreement about the social cost of monopolies is twofold. First, the dead-weight loss triangle in Figure 11 depends on the elasticity of demand, and in determining the dead-weight loss different economists used different estimates for the elasticity of demand. Second, the welfare cost of monopoly is larger than the dead-weight loss itself. Due to the high profits that the monopoly firms receive they will do their best to allocate resources – so-called rent-seeking behaviour – in such a way as to perpetuate their position, e.g. increase barriers to entry, influence government, etc. (Begg *et al.* 1984:372). However active the debate may be, most governments believe that the social cost of monopolies is sufficient to justify some form of regulation.

The theoretical models of perfect competition and pure monopolies rarely feature in the real market economy and, according to De Chazeau, “It is ‘oligopolistic’ situations which are the proper objects of antitrust policy” (Mason 1940:213).

The oligopoly is a market dominated by a few sellers (Prager 1993:429). South Africa exhibits high levels of concentration across industries in the economy and therefore needs to put the appropriate measures in place to combat the inefficiencies of oligopolies. Various attempts have been made at explaining the behaviour of firms that form part of an oligopoly. Explaining this behaviour becomes challenging as there are various degrees of interdependence between firms. Older models like the Cournot model focused on the duopoly and later models, e.g. game theory explained oligopoly behaviour according to the principles of the prisoner’s dilemma.

The oligopoly can deter entrance via barriers to entry and is therefore able to display anti-competitive behaviour like the monopoly. It would seem that the structure of the market plays an integral role in determining the degrees of freedom that are available to the market participants to display anti-competitive behaviour. Conduct, the link between structure and performance in the SCP paradigm, requires further study as this ultimately leads to the prevalence of inefficiencies and the construction of competition policy. The author will therefore discuss some elements of conduct as indicated in Figure 1(p. 10).

### 2.2.2.2 Pricing strategies

The perfectly competitive firm exhibits characteristics which leads to prices being determined through market powers at the level where they are equal to the marginal cost. This means that the value a society places on a specific product is equal to the opportunity cost of the scarce resources employed to produce the product. The individual firm in a perfectly competitive market faces a perfectly elastic demand curve and therefore cannot raise its prices above the market-determined levels, otherwise demand for its product will fall to zero. In the long run the firm in the perfectly competitive industry will make no economic profit and will earn a normal rate of return.

The models implying imperfect competition, however, enable the relevant firm or firms to exercise autonomy in establishing the prices of their products. This autonomy in accordance with the elasticity of demand, provides firms with the incentive to deviate from market-related prices in the pursuit of increasing and perpetuating their existing market power and profits. Some of the strategies used by firms include the following:

- Price discrimination exists when a firm supplies the same products (produced at the same costs) at different prices to different consumers or asks the same price of different consumers even though the costs to supply the products are not the same (Waldman *et al.* 1997:384). To be able to practise price discrimination requires not only a degree of market power, but also the ability to separate the available market into groups with differing elasticity of demand (Waldman *et al.* 1997:385).

Three types have been identified i.e. first-, second- and third-degree price discrimination. First-degree determines that each consumer pays their reservation price for a product and under second-degree price discrimination the discriminator offers all the consumers the same price schedule, and the consumers themselves select a price category<sup>8</sup> (Waldman *et al.* 1997:385-386). According to Waldman *et al.* (1997:387-39), third-degree price discrimination is the most common and

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<sup>8</sup> An example of second-degree price discrimination would be discounts offered on the basis of volume purchases, i.e. if a consumer buys one item he/she will pay more per item than if the consumer bought ten items.

depends on the discriminator's ability to separate consumers into different groups based on their different elasticities of demand at any given price.

Figure 12 illustrates two groups of consumers, the one facing a demand curve of  $P=200-Q$  and the second group facing  $P=100-Q$ . The demand of group one is more inelastic than the demand of group two<sup>9</sup>. Waldman and Jensen (1997:387) make the simplifying assumption that marginal cost is zero. Therefore to maximise profits MR should equal MC, should equal zero. For group one this means selling 100 units at a price equalling 100 and for group two selling 50 units at a price equalling 50. Price in the more inelastic group one is then twice the price in the more elastic group two.

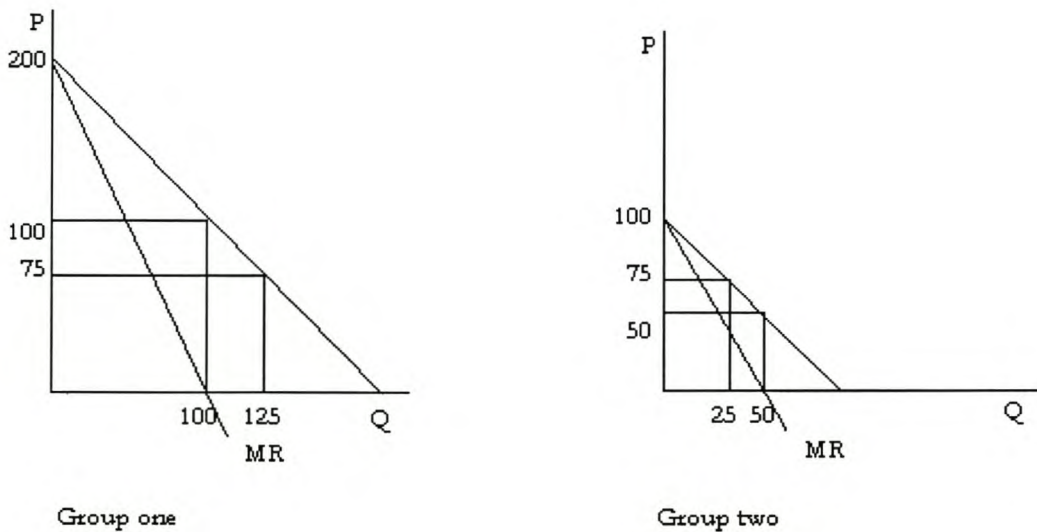


Figure 12: Third degree price discrimination

Source: Waldman et al. 1997:387

The Competition Act No. 89 of 1998<sup>10</sup> prohibits a dominant firm from practising price discrimination if it would lessen competition of the sale, in equivalent transactions, of goods or services of the same standard to different purchasers and involves discriminating between those purchasers in terms of the price charged

<sup>9</sup> For a linear demand curve the elasticity of demand,  $e_D$ , equals one at midpoint,  $e_D > 1$  above midpoint and  $e_D < 1$  below midpoint. At  $P=50$ ,  $e_D=1$  for group 2 and  $e_D < 1$  for group 1. At  $P=100$ ,  $e_D > 1$  for group 2 and  $e_D=1$  for group 1.

<sup>10</sup> Will be discussed in more detail in section 2.2.4.



(The New Act 2001:14). Regarding figure 12 under the above prohibition by law the firm will be forced to charge a uniform price to all buyers.

The firm faces the challenge of fixing a single price for its product. The combined demand curve for the two groups is shown in Figure 13<sup>11</sup>. MR equals MC equals zero; thus the profit-maximising quantity equals 150 at a price of 75 to all consumers. Therefore consumers in group 1 will purchase 125 units and consumers in group 2 will purchase 25 units.

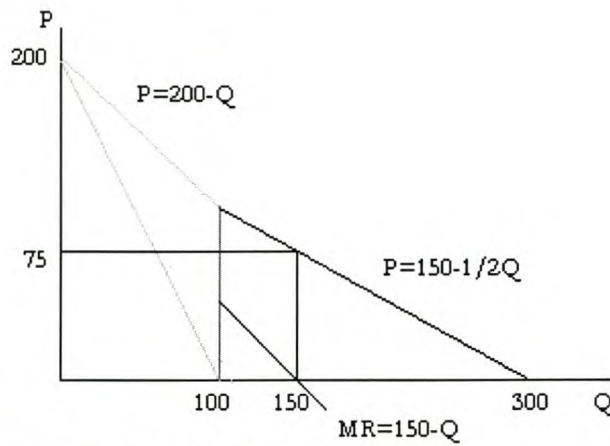


Figure 13: Combined demand curves  
Source: Waldman *et al.* 1997:391

Total output remained the same with or without price discrimination; the effect on welfare, however, measured according to consumer and producer surplus, gives a clear indication of the detrimental effect of this pricing strategy on society. Keeping in mind that  $MC=0$ , with price discrimination total producer and consumer surplus equals 18 750 and without price discrimination it equals 19 375<sup>12</sup> (Waldman *et al.* 1997:391).

<sup>11</sup>For  $100 < P < 200$  the demand for group 1 is relevant; thus in this price range combined demand is  $P=200-Q$  and  $MR=200-2Q$ . For  $0 < P < 100$  the demand of both groups is relevant. The horizontal summation of the two demand curves yields the following,  $P=150-1/2Q$  and  $MR=150-Q$ .

<sup>12</sup>

	Group 1	Group 2	Total
With price discrimination	15 000	3 750	18 750
Without price discrimination	17 187.5	2 187.5	19 375
Differences	-2 187.5	1 562.5	-625

- Limit pricing occurs where an incumbent monopoly chooses a low price (limit) policy with the aim of deterring entry into the market. The incumbent may choose a price that is below the average or marginal cost of a potential entrant. Even though this strategy might not be sustainable over a considerable period, and is not optimal in terms of profit maximisation for the incumbent, it consolidates the incumbent's market power base (Nicholson 1994:514). If the monopolist and a potential entrant have the same cost basis, it would mean that the purpose of a monopoly – i.e. making above normal profits – is defied and only a normal rate of return is possible in the case of a limit pricing strategy (Nicholson 1994:514).

In order for an incumbent monopolist to implement a limit pricing strategy, an assumption of asymmetric information must be made. If the monopoly knows more about the market situation than a potential entrant, e.g. an incumbent firm A chooses a low-price policy which may signal to a potential entrant B that A's costs are very low – it may thereby deter entry of B (Nicholson 1994:517). This existence of asymmetric information thus gives rise to the variant of limit pricing referred to as predatory pricing. An incumbent will use the strategy of predatory pricing to influence rivals' view of the future profitability of the relevant market and thereby inspire them to exit (Nicholson 1994:517).

The Competition Act No. 89 of 1998 prohibits firms from abusing their dominant position in a market, which includes anti-competitive actions such as predatory pricing. The dominant firm is not allowed to sell its goods or services below their marginal or average variable cost (The New Act 2001:14).

The above-mentioned pricing strategies can be employed by a dominant firm in a market with relative ease. Pricing strategies, however, become more complex in the case of oligopolies. In a market where the power is consolidated in the hands of a few role-players the chances of tacit collusion and horizontal mergers are very good. The stance of the Competition Commission regarding horizontal mergers and the resulting increase in market concentration was explained in section 2.2.1.2; however, the possibility of large firms colluding and the anti-competitive effects of such actions deserve further scrutiny.

The possibility of collusion between market participants gives rise to the prisoner's dilemma as described in game theory. According to this model it will be difficult to maintain collusive agreements for considerable periods, depending on the particular strategy employed, i.e. dominant strategy, tit-for-tat, trigger price strategy, etc. (Waldman *et al.* 1997:186). Games theory is an important theoretical instrument used by industrial economists to explain the pricing behaviour of the colluding firms. For the purpose of this work, game theory highlights the fact that the incentive and opportunity does indeed exist for firms to engage in anti-competitive action regarding their price-setting activities.

Colluding in such a manner gives rise to cartel formation, of which one of the best noted examples was the cement cartel consisting of Pretoria Portland Cement, Anglo-Alpha and Blue Circle Cement (Fourie *et al.* 1994:123). The cartel employed a pricing system called the Twycross pricing system whereby certain base factories close to limestone deposits were selected and of these the most efficient producer based on lowest average price per pocket of cement was identified. This average price then served as a benchmark for other base factories with the provision for certain cost disadvantages (Fourie *et al.* 1994:131).

The cartel not only participated in price fixing, but also created various market-sharing agreements by which transporting costs were minimised and market shares were held stable, thereby perpetuating the cartel in the cement industry (Fourie *et al.* 1994:132). Fourie and Smith (1994:140) tried to establish if the cartel was more efficient in allocating, utilising and distributing resources than a more competitive market arrangement. Even though prices were 1.1 percentage points higher than the average annual price increase of the manufacturing sector, it was difficult to ascribe this increase solely to monopolistic abuse, as Fourie and Smith were uncertain what part increased cost factors in the cement industry played in the price hike.

Fourie and Smith (1994:141) used a further indirect measure of prices, i.e. profitability and estimated that average profitability was very high, almost twice the average of the building materials industry and four times the average of the manufacturing sector. These high levels of profitability in a tri-firm concentrated market as well as the fact that there had been an absence of entry in the cement

industry since 1934, raised the possibility that the cartel was exploiting its position raising prices above marginal cost, thereby misallocating resources in a monopolistic fashion.

Donald Dewey (1979) made various assumptions<sup>13</sup> in an attempt to justify collusion and to condemn “antitrust harassments” of price-fixing on the grounds that collusion provides a certain element of price stability under the auspices of free entry. Dewey (1979:590) referred to collusion as firms agreeing to charge a common price and any alterations of this price would be on the basis of mutual consent, as well as entailing the pooling of relevant data on prices and costs.

Leach (1994:262) used Dewey's assumptions to disprove Fourie and Smith's (1994) conclusions that the cement cartel was guilty of inefficiency. He argued that the cement cartel fitted in the Dewey model perfectly, as there were no barriers to entry and co-operation between the cartel members regarding price-fixing provided definite efficiency gains (Leach 1994:264). In short, Leach contended that a cartel is able to reduce uncertainty, thereby allowing for better planning and increased investment (Leach 1994:274).

Dewey's assumptions regarding the waste of government resources to prevent price fixing have been the subject of critique. Grawe and Overstreet (1982:259) point out that, in the light of the central position granted to information in Dewey's analysis, he surely also had the obligation to note that “insider advantages can create incentives for firms or their higher agents to engage in disinformative activity to discourage entry”. Grawe and Overstreet (1982:260) further state that The Federal Trade Commission

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<sup>13</sup> Some of Dewey's assumptions:

- Production takes place by means of successive periods through which there will always be an element of uncertainty that cannot be fully eroded through learning by doing.
- Industry consists of firms that sell in a homogenous imperfect market due to the cost associated with acquiring information.
- Entry is free.
- The legal system matters. A change in rule that reduces the cost of collusion will encourage agreements which will lead to a decrease in the number of price changes made by all the firms in the industry, which will have an effect on profitability and industry output.

(FTC) does recognise the merit of informative activities based on conclusions from various previous cases.

In conclusion,<sup>14</sup> the FTC gives merit to the sharing of information. However, they do not deny the possibility of insider abuse of information to deter entry and perpetuate and enhance their market position. This monitoring action requires expenditure and anti-trust action by authorities (Grawe and Overtsreet 1982:261).

Fourie and Smith (1995:91) reacted sharply to Leach's implementation of Dewey's assumption on the cement cartel in South Africa. According to them, Leach's attempt was carried out in typical Chicago School fashion whereby "measures are redefined until the data fit the belief". The 'belief' Fourie and Smith refer to is based on the efficiency hypothesis of Demsetz. These conflicting views between the more structuralist-orientated Fourie and Smith and the obviously Chicagoan Leach pre-empt the debate that will follow in Chapter 3.

Even though both sides of the debate on the welfare implications of collusion deserve validation, it is important to notice that a market conducive to collusion also provides the framework needed to exercise anti-competitive behaviour. The nature of such anti-competitive behaviour, whether through horizontal or vertical actions of incumbent firms, is explained in the Competition Act, No. 89 of 1998. The Act prohibits any of the following horizontal practices:

- The direct or indirect fixing of a purchase or selling price (The New Act 2001:11). There are various techniques that colluding firms can employ to evade the prisoner's dilemma, i.e. dominant firm price leadership, collusive price leadership, barometric price leadership and the basing point pricing system (used by the

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<sup>14</sup>The conclusions of the FTC:

- Simple information collection and exchange with regard to price, output, cost and selling practices by competitors are not illegal.
- The activities of trade associations will be accepted if gathered data are made available to customers and potential entrants.
- If the activity of information sharing results in increased output and lower price or profit variations, the court will not object.

cement cartel) (Waldman *et al.* 1997:202-215). Utilisation of these techniques would signal prohibited collusive activity and will lead to complaints (Table 6, p. 71) and further investigation by the Competition Commission. The Act further defines that, in the case of a horizontal restrictive practice, a prohibited agreement is presumed to exist should any of the firms in question own a substantial shareholding, interest or similar right in the other or should they have a director or substantial shareholder in common (The New Act 2001:11).

- The division of markets through the allocation of customers, suppliers, territories or specific types of goods and services and any attempt at collusive tendering (The New Act 2001:11).

Restrictive practices need not be limited to horizontal actions but encompass various vertical practices as well. The Competition Act prohibits with definite certainty any anti-competitive vertical relationships, e.g. resale price maintenance, where a supplier is not allowed to force the reseller of the product to ask a minimum resale price. The Act, however, makes provision for a recommended price on the premise that the supplier makes it clear to the reseller that the recommendation is not binding (The New Act 2001:12).

Prohibited practices like the different pricing strategies exercised by dominant firms, whether through a colluding agreement or by a monopoly, have detrimental effects on fair competition. It is important to realise that a substantial degree of anti-competitive behaviour could be associated with collusion, as collusion plays an important role in the Demsetz interpretation of Bain's 1951 article. This will become clearer in Chapter 3.

There are also numerous other prohibited practices associated with dominance in a specific market. A breakdown of complaints received regarding the abuse of dominance and prohibited vertical and horizontal conduct is provided in Table 6<sup>15</sup>. The actions stipulated in Table 6 under the heading of abuse of dominance, apart from

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<sup>15</sup> Table 6 is on page 71 in section 2.2.4.3. Further discussion regarding collusion and the abuse of dominance in the South African scenario also appears in section 2.2.4.2.

the pricing strategies explained above, are fairly self-explanatory. The Competition Act, No. 89 of 1998 provides clear rules regarding such actions (The New Act 2001:13).

### 2.2.2.3 Mergers

The stance of the Competition Commission regarding the formation of mergers has been mentioned in the Trident Logistics example<sup>16</sup> and will also be discussed further in section 2.2.4.3. The focus of this section is on the role of mergers in the conduct link of the SCP paradigm.

Mergers can be classified as being horizontal<sup>17</sup>, vertical<sup>18</sup> or conglomerate<sup>19</sup>, depending on their particular relation prior to the merger (Prager 1993:452). According to Waldman and Jensen (1997:506), all mergers take place with one mutual concern, namely “that the one company believes the acquired company is worth more than the acquired company’s owners believe”. Whatever the incentive may be, a horizontal merger will lead to an increase in concentration and a possible increase in market power, e.g. Trident Logistics, and therefore, according to Waldman and Jensen (1997:506), will exceed vertical and conglomerate mergers in their likeliness to cause anti-competitive effects.

There are various other incentives, apart from increased market power, which would make firms eager to take part in a merger, e.g. the resulting efficiency gains like economies of scale, the reduction of production and marketing cost and the elimination of x-inefficiencies (Waldman *et al.* 1997:507). There may also be a financial motive in the hope that synergetic results may come forth out of a merger. The apparent efficiency gains for the respective participants in a merger, however, must be compared to the effects of the merger on competition and welfare.

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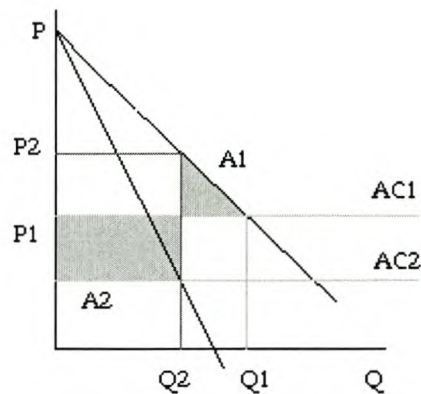
<sup>16</sup> Section 2.2.1.2, p. 28.

<sup>17</sup> Horizontal mergers take place between competing firms.

<sup>18</sup> Vertical mergers take place between firms at different levels in the same production chain.

<sup>19</sup> Conglomerate mergers involve companies that operate in unrelated product markets, or the same product markets but in different geographic markets.

A horizontal merger that results in economies of scale for the parties involved as well as increased concentration levels may, according to the American merger guidelines (2001:15), allow the firms selling in that specific market to co-ordinate their interactions more successfully to the detriment of the consumer. O.E. Williamson has devised a theoretical structure to explain this effect.



*Figure 14: Cost saving and dead-weight loss  
Source: Williamson 1972:115*

According to Williamson's theoretical model (1972:114), it is assumed that no position of market power existed prior to the merger. Therefore the pre-merger price and quantity in Figure 14 is  $Q_1$  and  $P_1$  as the horizontal line  $AC_1$  represents the level of average cost of the firms before the merger. The price and quantity after the merger are  $P_2$  and  $Q_2$  (Figure 14). Should a post-merger price lower than  $P_1$  have realised, the economic effect of the merger would have been positive.

To calculate the net welfare effect of the merger, the two shaded areas in Figure 14 must be considered. The triangle  $A_1$  shows the dead-weight loss that realised due to the price increase from  $P_1$  to  $P_2$  if costs remained constant. Costs decreased, however, from  $AC_1$  to  $AC_2$  and thus resulted in the shaded rectangle  $A_2$  (Williamson 1972:116). Should the triangle  $A_1$  be larger than the rectangle  $A_2$ , the merger has net negative effects and conversely should  $A_2 > A_1$  the merger would have net positive effects.



This is merely a static partial equilibrium model by Williamson and does not incorporate multi-sector monopoly effects due to a merger. The model, however, introduces the ‘balancing act’ required by competition authorities to ensure a fair trade-off and net positive welfare effects resulting from a merger or otherwise the termination thereof.

Vertical mergers, otherwise referred to as vertical integration, were discussed in section 2.2.1.4 under market structure. To show the negative welfare effects that can emerge as a result of prohibited vertical actions, the author will provide a more in-depth discussion.

In the previous section under pricing strategies the author mentioned resale price maintenance that could result from vertical integration. Most resale price maintenance agreements determine a certain minimum resale price. It might seem peculiar that a manufacturer might set a certain minimum price because the lowest possible retail price will increase sales for that particular manufacturer. According to Waldman and Jensen (1997:415), there are reasons for such behaviour. First, the price maintenance agreement may be the result of smaller retailers that make some sort of collusive attempt to keep prices high (above marginal cost). Second, resale price maintenance might make it easier for tacit collusion to take place between manufacturers. Third, to protect the prestige of the manufacturer’s product, it may place a minimum price on its product to prevent the retailer from selling it at too low a price.

Vertical integration may also be used to raise barriers to entry through exclusive dealing arrangements. According to this arrangement, a retailer agrees to sell only one manufacturer’s products. This means that a manufacturer with market power may effectively prevent rivals, whilst charging a price above the potential entrants marginal cost (Waldman *et al.* 1997:418). Vertical integration could further be used to raise input prices and, together with decreased prices on finished goods, a dominant firm may exercise a price squeeze on rivals. The capital barrier to entry can also be raised through vertical integration as it could force the potential entrant to enter at more than one production stage (Waldman *et al.* 1997:420).

Another detrimental impact that vertical integration might have on the structure of a particular market could be foreclosure. Foreclosure refers to manufacturers experiencing difficulty finding buyers for their products and retailers struggling to find inputs (Waldman *et al.* 1997:421). Vertical integration may therefore prevent potential entrants from entering a market out of fear of foreclosure.

Vertical arrangements could also take place according to a conglomerate merger. This could definitely increase market power through the elimination of potential competition. Conglomerates may also use reciprocal buying, i.e. require suppliers to purchase inputs from various divisions of the conglomerate, and cross-subsidisation, i.e. extending market share in other markets using profits gained in the other markets to subsidise losses. These actions will give rise to prohibited competitive issues.

According to Caves (1980, cited in Massoud *et al.* 1990:433), conduct can be defined as “policies that participants adopt toward the market (and their rivals in it) with regard to their price, the characteristics of their product, and other terms that influence market structure”. The general tendency towards Structure, Conduct, Performance analysis is to compare concentration (structure) and performance in an attempt to find a causal link. Scherer (1980) suggested that intermediate structure-conduct and conduct-performance studies might enable more precise predictions of performance (Massoud *et al.* 1990:434). Thus for the purpose of this work the reader should be aware of the conduct possibilities that exist, and how the various market structures could be conducive to anti-competitive behaviour. Conduct serves as an important link between structure and performance.

### **2.2.3 Performance**

This section is basically a culmination of the theory explained thus far and forms a crucial part of what is to follow in Chapter 3. At the risk of over-simplifying the concept, performance refers to the social impact of a specific action. According to the Structuralists, a specific market structure will determine conduct, which will have an impact on society. The impact on society is determined through the long-run cost curves of the various market structures and their ability to set price above marginal cost.

Although performance according to Figure 1 encompasses various aspects like quality of products and service as well as equity, the author will mainly focus on allocative and production efficiency as well as the rate of technological advance resulting from different market structures.

The modern tendency is to explain the concept of efficiency on the basis of Vilfredo Pareto's defined "pareto optimality". According to this Italian economist, efficiency is a point where "no one can be made better off without making someone else worse off" (Samuelson and Nordhaus 2001:286). This framework can be implemented to define allocative efficiency as a point where no reorganisation of production or consumption is possible that will make one person better off at no cost to someone else.

Given the assumption associated with perfect competition, it is known that in the long run no economic profits are possible, only normal profits as supply and demand interactions determine the price. This long-run equilibrium position yields the favourable characteristic of price equalling marginal cost. That is to say production in the perfectly competitive market is at such a level that the value the consumers ascribe to the product is equal to the opportunity cost (as viewed by the consumer) of the resources used to manufacture the product.

In the case of perfect competition the marginal benefit (MB) for the consumer is represented by the price and is equal to the marginal cost (MC) to the consumer. Rational economic behaviour should be such that the level of activity be expanded or contracted to enable a situation where  $MB = MC$ . This situation of private efficiency could be extrapolated to include the whole society. Therefore social efficiency is the point at which the marginal benefit to the society (MSB) is equal to the marginal cost to society (MSC) (Sloman 2000:290). Should MSB be larger than MSC regarding a specified product, society would gain from an increase in the production of that product. The contrary would also hold true.

The long-run condition for the perfectly competitive industry is possible as an individual firm faces a perfectly elastic supply curve and any attempt to change the price will be to its detriment. Furthermore the perfectly competitive firm has no

means of protection against potential competition. The monopoly, however, determines its price without the risk of, or at least at a level of reduced risk regarding, potential competition. This position, as explained in the previous sections, is possible due to barriers to entry.

The monopolist can maintain a price above marginal cost. This would mean that MSB is larger than MSC and therefore society would benefit from increased production. It would be possible to increase production thereby enhancing the position of some without cost to another. The monopolist therefore exhibits allocative inefficiency at equilibrium, as increased production will equate MSB and MSC.

Production efficiency refers to the lowest cost production of every item. The long-run equilibrium position of the perfectly competitive industry takes place at the minimum of long-run average cost. The monopolist does not function at that equilibrium point and could maintain equilibrium at a higher point on the long-run average cost curve. This would mean that the monopolist is not functioning at the lowest cost possible and therefore does not display production-efficient conduct.

The other non-perfect market structures reveal definite similarities with the monopolistic markets structure in so far as allocative and production inefficiencies are concerned. It would appear then that there is some sort of relationship between performance and market structure. To be able to determine the exact nature of such a relationship a definite measure of performance is needed.

The concept of performance measurement will be expanded upon in Chapter 3 as it is at the heart of the concentration-profits relationship. Taking into account that market structure determines autonomy regarding price setting, a means of measurement might be the Lerner index (Waldman *et al.* 1997:434). The Lerner index devised by Professor A.B Lerner and could be defined as:

$$P-MC/P$$

and directly measures the increase in price above marginal cost (Prager 1993:470).

The use of the Lerner index, however, provides a serious challenge with respect to the gathering of data on firms' marginal costs. This challenge lies in the selection of the correct measure to be used as proxies for the Lerner index. Some of these proxies, according to Waldman and Jensen (1997:434), include:

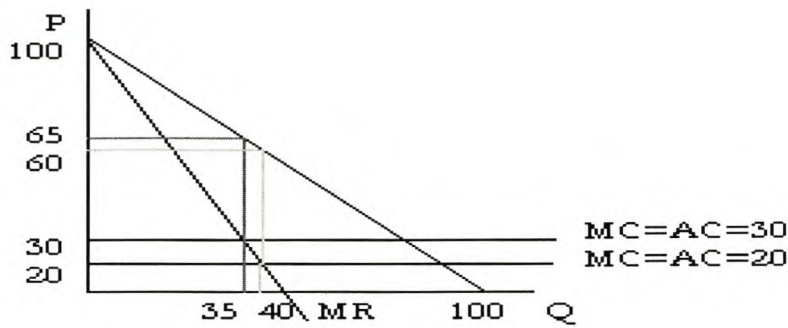
- Excess return on sales which provides information on the ratio of economic profits to sales revenue and equals  $(TR-TC)/TR$ . The discrepancies between economists' and accountants' perceptions of economic profit complicates the interpretation of this proxy. A more in-depth discussion will follow in Chapter 3.
  
- Profit rate or rate of return refers to the incorporation of accounting profits as a measure of relative performance. Studies in this regard have used  $(\text{Profits}-\text{Tax})/E$  to calculate the rate of return.  $E$  is stockholders' equity and the tax refers to the tax on profits. This measure, however, is very sensitive to the debt/equity ratio across firms due to the fact that debt-holders get paid before stockholders should a firm get into financial trouble. Stockholders therefore require a higher rate of return from a firm with a high debt/equity ratio. To lessen the problems the proxy is altered moderately by using the rate of return on assets after tax  $(\text{Profit rate}-\text{Tax}+I)/A$ , where  $I$  refers to interest payments to debt-holders and  $A$  is total assets. Again, both these interpretations are subject to the indifferent economic and accounting profits.
  
- Price-cost margins provide a measure for performance under the assumption of constant returns to scale whereby long-run average costs equal long-run marginal costs. It is not easy, however, to identify all relevant costs involved.
  
- Tobin's  $q$  provides a means of side-stepping the problems associated with rate of return and price cost margins. Tobin's  $q$  measures profitability via the ratio of the market value of a firm to the replacement value of its assets. A perfectly competitive firm in long-run equilibrium will have a  $q$  value of 1, as its market value will be the same as the cost it would take to replace it. The  $q$  value will be above 1 if there are barriers to entry, as market value will be above the replacement value.

The above discussion on measures of profitability is merely intended to introduce some of the measures. In Chapter 3 the author will refer to the attempts made by South African researchers to measure profitability in the manufacturing sector. In section 3.2 the author will measure profitability in the long-term insurance industry and provide a more in-depth discussion on the applied measure.

It has become quite apparent that market structure has an influence on conduct and profitability. To highlight this point even further the author now includes a short discussion on how market structures can influence an element of performance, namely technological advance. This discussion, though it plays an explanatory role regarding performance, is mainly to advance the reader's comprehension of the influence that market structures can have.

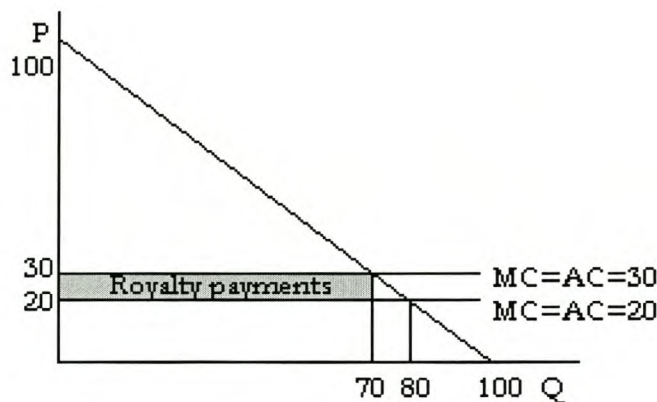
Schumpeter (1942:61) claimed that "Capitalism ... is by nature a form or method of economic change and not only never is, but never can be, stationary". This notion of capitalism being a dynamic process drew attention to the idea of technological advance and innovation. Waldman and Jensen (1997:348) refer to a model devised by Arrow to illustrate the role of market structure in this dynamic process. The model is based on the premise that there will be some incentive for firms to be innovative in order to bring about cost savings.

Suppose two markets yield identical demand curves, i.e.  $P = 100 - Q$ . Figure 15 provides a graphical explanation of what would happen to a monopolist applying such a cost reduction. Initially  $MC = AC = 30$  and equilibrium quantity and price are 35 and 65 respectively. The profit made by the monopolist is 1225. After a cost-reducing innovation  $MC = AC = 20$  and profits increase by 375 to 1600.



*Figure 15: Cost reduction by the monopolist*  
 Source: Waldman and Jensen 1997:348

The effect of the same cost-saving innovation in a perfectly competitive market is illustrated in Figure 16. The equilibrium price and quantity with the initial  $MC=AC=30$  is 30 and 70 (zero profits). If one firm patents a cost-saving innovation that decreases cost to  $MC=AC=20$ ; it is not possible to raise its price above 30 and therefore the best option will be to license the patent for a royalty 10 per unit of output. The patent holders royalty receipts will equal 700.



*Figure 16: Cost-saving in perfectly competitive market*  
 Source: Waldman and Jensen 1997:349

The receipts from the cost-saving innovation are almost double the increase in profits for the monopolist. It would appear then that a perfectly competitive firm has a greater incentive to take part in cost-saving innovations. Waldman and Jensen (1997:350) argue that even though the perfectly competitive firm has a higher incentive than the monopolist to innovate, the apparent lack of profits causes a severe

capacity constraint that hampers the practicality of this incentive. It would appear, according to them that, in the light of high levels of competition and the possible availability of excess capacity, the oligopoly is the only market structure that is highly conducive to innovative behaviour.

After examining the various elements of the SCP paradigm and witnessing the undoubted influence of the elements on each other, it is necessary to devote some attention to the role of government to ensure fairness. The SCP paradigm does indeed provide a strong theoretical framework and it is but a small step away from concluding with an indisputable forward causality argument. Before any further attention can be given to the causality debates and uncertainties surrounding SCP, it is necessary to discuss why the SCP provides such lucrative backing for competition regulation.

#### **2.2.4 Regulating Competition**

The initial rationale for regulation was based on the existence of large economies of scale. According to the American Congressional Budget Office, regulation includes activities that impact on the following:

- The operating business environment of broad sectors of private enterprise and includes issues such as market entry, rate, price and profit structures and competition;
- Specific commodities, products or services through permit, certification or licensing requirements (Mitnick 1980:2).

Regulation, however, cannot be explained in one list of tools and targets. The somewhat apparently simplistic concept of regulation has much more to offer. One must realise that regulation as such is not directly part of the activity that is being regulated; rather it could be seen as an act of interference, a diversion from what would otherwise occur. This interference could either have no effect, help or harm a second party. It is important to keep in mind that any action of mine that creates an unwanted by-product, e.g. pollution, may lead to regulation of the core action to prevent or lessen the unwanted externalities.



According to Barry Mitnick (1980:5-7), regulation could be explained by the following definitions:

- “Regulation is the intentional restriction of a subject’s choice of activity, by an entity not directly party to or involved in that activity;
- Regulation is the policing, with respect to a goal, of a subject’s choice of activity, by an entity not directly party to or involved in that activity;
- Regulation is the policing, according to a rule, of a subject’s choice of activity, by an entity not directly party to or involved in that activity;
- Regulation is the public administrative policing of a private activity with respect to a rule prescribed in the public interest.”

This evolving set of definitions clearly indicates that regulation is a continuous action, according to rules set up by the government, to protect the public interest against private actions.

A further distinction must be made between economic and social regulation. Economic regulation refers to control over a wide array of economic aspects such as prices, entry and exit conditions, etc. Social regulation is aimed at managing externalities to ensure that sufficient health and safety standards prevail.

#### 2.2.4.1 The rationale for regulation

Samuelson and Nordhaus (1989:586) indicate two reasons for economic regulation:

- “Economists stress the importance of containing market power;
- A second reason derived from the public choice theories, is that regulators are ‘captured’ by the regulated.”

These two reasons need to be discussed in further detail:

- **Containing market power:** At this stage it is apparent that regulation should be employed by the government to correct market failures like natural monopolies and breakdowns in competition. Natural monopolies come into existence when one firm in an industry can produce the entire output of that industry most efficiently (Samuelson and Nordhaus 1989:586). This could happen when technology in an industry permits economies of scale to such an extent that average costs decline for all increases of output levels. The layout

of the technology normally involves a substantial capital investment, i.e. power station or telephone companies. Once the capital investment is concluded, as in the case of a power plant providing electricity to additional units, average cost continuously declines. A further source of natural monopolies is economies of scope, which occur when a number of different products can be produced more efficiently together than by separate firms (Samuelson and Nordhaus 1989:58). An example of this is transport equipment manufacturing firms, which due to specialised knowledge and machinery could manufacture buses and tanks with extreme efficiency. Regulation is needed to prevent unfair competition in the imperfect competition arena and it protect incumbents from abusing market power.

- Interest-group theories of regulation: This theory suggests that regulation results from the interplay of political forces and economic interests in regulated industries. Seeing that regulation is normally coupled with the elimination of competition in that industry, the regulated firm wants regulation to be perpetuated to prevent competition and ensures profits and exclusivity. The suppliers of regulations, the legislators and administrators, want to remain in power and therefore welcome campaign contributions and thereby uphold the regulatory cartel (Samuelson and Nordhaus 1989:587). The theory may seem far-fetched, but is supported by numerous studies on economic regulation.

There are quite a few ways in which government can intervene when it comes to monopolies. The following are some of the approaches that have been used in the past:

- Taxes: Monopoly profits can be reduced by means of taxation, thereby reducing the socially unacceptable effects of the monopoly. The problem associated with taxes, however, is that they may lead to increases in price and the lowering of output further to counter the tax effect on profits (Samuelson and Nordhaus 1989:585).
- Price Controls: This method was used by the government of the United States in the early 1970s in an attempt to keep inflation low by keeping

down prices in concentrated industries. Few economists view this as an efficient method, however, and feel that it is like “destroying the whole garden to kill a few chinch bugs” (Samuelson and Nordhaus 1989:585).

- Government ownership of monopolies: The choice between regulation and public ownership is something that depends on a nation’s history and institutions. The impulse to privatise, however, has increased substantially in the recent past (Samuelson and Nordhaus 1989:585).
- Economic regulation: This allows regulatory agencies to oversee the prices, outputs, and entry and exit circumstances in regulated industries and pervades public utilities and financial markets (Samuelson and Nordhaus 1989:585).
- Antitrust policy: This is a further tool the government can use to curb monopoly power. Antitrust policy involves laws that prohibit certain actions, e.g. mergers, and limit structures like monopolies (Samuelson and Nordhaus 1989:585). In this instance firms are told what not to do, whereas in the case of regulation, firms are told what to do.

In the beginning of this section it was said that regulation could be used to contain market power. The theoretical background sketched the implications of allocative inefficiency and why regulation must be considered. In the following sections the focus will be on some international as well as South African examples regarding the conduct of regulating industries to ensure an optimal outcome for the society at large.

#### 2.2.4.2 International competition measures

This section will provide the reader with an international background on competition policy before South African regulatory measures are discussed. An in-depth study of the specific laws and articles in the different countries is not the aim here, but rather a quick overview of the origin of competition policy in other countries is provided. This will indicate the world-wide support for competition measures in some form or another.

In the mid- to late nineteenth century it became quite fashionable for American businesses to drive competition out of markets and many smaller firms were taken over by big firms. Various activities like price fixing, cartel formation and predatory pricing were at the order of the day. People started to react against these evident anti-competitive actions by large firms and in 1867 the National Grange was formed as a pressure group on behalf of farmers against so-called big business (Case and Fair 1999:349).

In 1887 the US government formulated the Interstate Commerce Commission to investigate the abuse of power in the railroad industry and in 1890 the government passed the Sherman Act, which acted as landmark legislation against monopolies. Certain problems with the correct interpretation of the Sherman Act forced Congress to revise. In 1914 the Clayton Act was passed to strengthen and clarify the Sherman Act. Various other acts followed to define fair and just conduct and to ensure competitive industry in America (Case and Fair 1999:352).

In the European Union modern competition policy began with French representatives proposing a common European market for iron, coal and steel in 1950. This proposal was adopted through the Treaty of Paris according to which France, Germany, Luxembourg, the Netherlands, Belgium and Italy established the European Coal and Steel Community (ECSC). The aim of the Treaty was to establish guidelines for competitive behaviour through merger controls and the prohibition of discriminatory pricing and other anti-competitive horizontal and vertical actions (Morton 2001:1).

In 1957 the members of the ESCS signed the Treaty of Rome, which expanded the original Treaty beyond the original three commodities to all industries, thereby forming the European Economic Community (EEC) (Morton 2001:1). According to Morton (2001:1), the purpose of competition policy in the EU is not to protect competition – as is the case in US competition policy – but rather to integrate the European Community.

Industries in Japan prior to American occupation were largely controlled by the *zaibatsu*. These large business conglomerates controlled 544 companies which totalled approximately 25% of all Japanese enterprises up to the early part of the twentieth century. During the American occupation the power of the *zaibatsu* was

broken as economic deconcentration in 1946 led to the freezing of *zaibatsu* assets. The Anti-Monopoly Law (AML) was passed in 1947 and applied under the supervision of the Occupation forces until Japan regained its sovereignty in 1952. The AML determined stricter competition policy than the Sherman or Clayton Act but upon the departure of the Occupation forces the Japanese Government weakened the AML (Morton 2001:4).

Today Japanese competition policy is mainly in the hands of the Ministry of International Trade and Industry and focuses largely on three areas of unacceptable conduct, namely monopoly, cartels and unfair business practices. The AML also addresses the legality of mergers (Morton 2001:5).

#### 2.2.4.3 South African competition measures and regulatory bodies

The ANC had indicated their intention in respect to industry regulation as early as 1992 in its Policy Guidelines for a Democratic South Africa. The proposal stated: “The concentration of economic power in the hands of a few conglomerates has been detrimental to balanced economic development in South Africa ... The ANC will introduce anti-monopoly, anti-trust and merger policies in accordance with international norms and practices and promote greater efficiency in the private sector” (The Role of Competition Policy Guidelines 2001:1).

The broad guideline provided above crystallised in what is commonly known today as the Competition Commission. The Competition Act, No. 89 of 1998, which came into effect on the 1 September 1999 and replaced the Maintenance and Promotion of Competition Act of 1979, provides the legislative authority for the powerful implementation of competition law in South Africa. The institutions needed for the implementation as well as the instruments available to these institutions are enclosed in the Act (Competition News 2000:16).

Competition policy originated from the Regulation of Monopolistic Conditions Act of 1955; however, a review of this act in the 1970s revealed limited powers in the prevention of the formation of new oligopolies. This led to the introduction of the Maintenance and Promotion of Competition Act of 1979 and the appointment of the Competition Board tasked with overseeing and administering the 1979 Act. In 1986 amendments were introduced in an attempt to increase the powers of the Competition

Board to act against new as well as existing monopolies and oligopolies (Competition Commission 2000:1)

The amendments to the 1979 Act, however, did not correct the technical flaws that prevented the effective application of competition law. Ineffectiveness was perceived in a number of areas of application, i.e. globalisation and trade liberalisation, high concentration levels in particular product and geographic markets and concentrated ownership structures (Competition News 2000:16).

In 1995, after an extensive consultation period, the Department of Trade and Industry provided a competition policy framework. In 1997 the Department released Proposed Guidelines for Competition Policy, which formed the basis for the National Economic Development and Labour Council (NEDLAC). The NEDLAC process was aimed at orchestrating an agreement between business, government and labour regarding principles of competition policy. An agreement was concluded on 29 May 1998 and passed in parliament in September 1998; it became effective on 1 September 1999 (Competition Commission 2000:2).

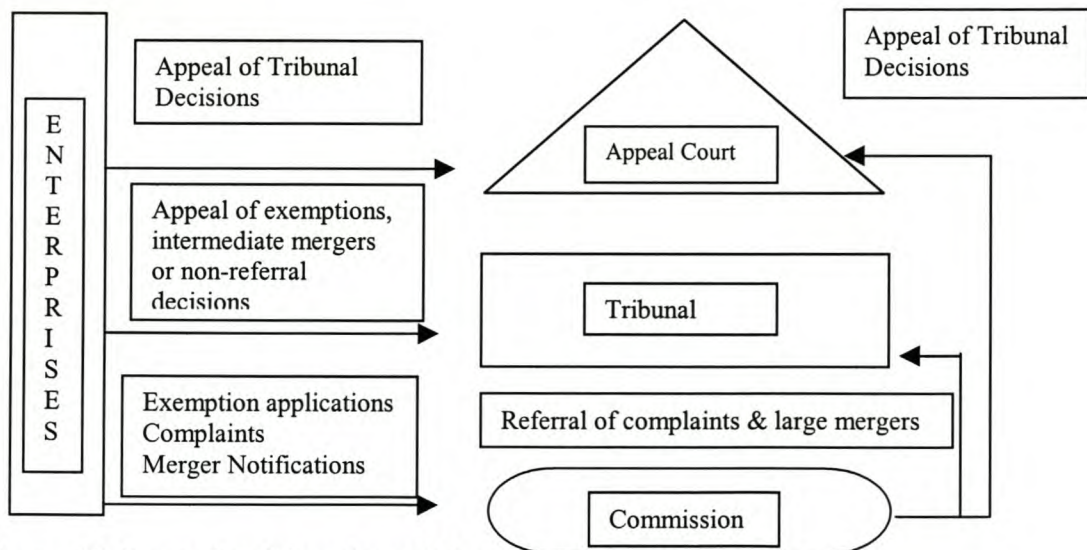


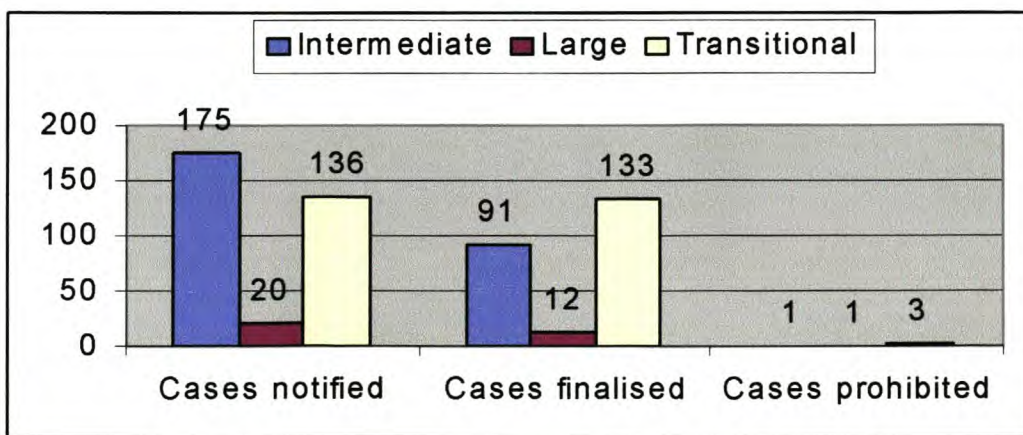
Figure 17: Interrelated functions of the Competition Authorities  
 Source: Competition News 2001:17

The Competition Act, No. 89 of 1998 “provides for the establishment of a Competition Commission responsible for the investigation, control and evaluation of restrictive practices, abuse of dominant positions, and mergers; and for the

establishment of a Competition Tribunal responsible to adjudicate such matters; and for the establishment of a Competition Appeal Court” (*The New Act 2001:1*). Three institutions were thus established in accordance with the Act of 1998 to uphold and administer competition policy in South Africa. The interrelated functioning of these institutions is demonstrated in Figure 17. These functions will become clearer in the in-depth discussions on the respective institutions.

- The Competition Commission: The Commission has an investigative duty regarding the conduct of role players in all industries in the South African economy. This includes all anti-competitive practices, approving and referring of proposed mergers and the advising of any regulatory authority (*Competition News P4:17*). All intermediate mergers, as distinguished according to post-merger combined turnover or assets size in Chapter 3 of the Competition Act 1998, must be approved by the Competition Commission (*Competition Commission Annual Report 2000:19*).

To keep in pace with the dynamics of merging firms, the requirements of Chapter 3 regarding the size adjudication of mergers have been amended. In terms of the new regulations that came into operation on 1 February 2001, the lower threshold of mergers has been raised from R50 m to R200 m and the value of the primary targeted firm was increased from R5 m to R30 m (*Business Day 2001:1*). Merger activity in South Africa for the period since the Commission has been functioning is shown in Figure 18.



*Figure 18: Merger activity in South Africa*  
 Source: *Competition Commission Annual Report 2000:20*

Transitional mergers refer to both large and intermediary mergers which occurred between 1 November 1998 and 31 August 1999 and did not receive the approval of the Competition Board during that period (Competition Commission Annual Report 2000:20). According to information gathered from finalised cases, the most significant merger and acquisition activities took place in the financial services and information technology sectors. In the United States these two sectors led the merger activities for the period 1998/99 as well (Competition Commission Annual report 2000:21). Hence the inclination to apply the theory on the long-term insurance industry (financial services industry) in Chapter 3.

In accordance with Chapter 2 of the Act of 1998, the Commission is required to investigate the following prohibited practices: restrictive horizontal practices, restrictive vertical practices and abuse of dominance. These practices as discussed in section 2.2.2 will be investigated by the Commission, and if found to occur, could be referred to the Competition Tribunal for adjudication (Competition Commission Annual Report 2000:34). A breakdown of restrictive practices investigated by the Commission is provided in Table 6.

*Table 6: Break-down of restrictive practices in South Africa*

Restrictive practices	No. Received	% of Total	No. resolved	No investigated
<b>Horizontal</b>	<b>21</b>	<b>17</b>	<b>6</b>	<b>15</b>
Fixing prices	11	9	5	6
Market sharing	10	8	1	9
<b>Vertical</b>	<b>27</b>	<b>22</b>	<b>5</b>	<b>22</b>
General	26	21	5	21
Price maintenance	1	1	0	1
<b>Abuse of dominance</b>	<b>74</b>	<b>61</b>	<b>26</b>	<b>48</b>
Excessive prices	3	2.5	1	2
Access to essential facility	3	2.5	1	2
General exclusionary acts	30	25	11	19
Refusal to deal	14	11	2	12
Refusal to supply	6	5	0	6
Tying of unrelated goods	2	2	0	2
Predatory pricing	6	5	1	5
Price discrimination	10	8	10	0
<b>Total</b>	<b>122</b>	<b>100</b>	<b>37</b>	<b>85</b>

*Source: Competition Commission Annual Report 2000:38*



The Commission has thus far received 93 cases of alleged prohibited practices. With this information the Commission identified industries that could be conducive to potential competition transgressions. Characteristics of these industries are high levels of concentration, high barriers to entry, low imports and high profit levels. Particular industries that reveal these characteristics in the South African economy are telecommunications and information technology, pharmaceuticals, food and beverages, chemicals, paper and pulp, building materials and the services sector (Competition Commission Annual report 2000:37)

The majority of complaints that the Commission received (61%) related to abuse of dominance. In terms of the Act a firm has a dominant position in a relevant market if its market share exceeds 45%; if it has a market share between 35% and 45%, unless the respondent can show that it does not have market power; or if it has a market share of less than 35% but has market power. The Act does not prohibit dominance in itself. However, the large number of complaints received by small firms relating to dominance abuse, highlights the importance of regulating the conduct of dominant firms (Competition Commission Annual Report 200:37).

The Commission explains the 21% of complaints alleging collusion by referring to the South African economy as being highly concentrated. Direct causality between structure and anti-competitive conduct, i.e. collusion, has not been established conclusively; however, the Commission feels that it is generally accepted that collusive conduct is more likely to occur in highly concentrated markets. Hence their explanation for the high frequency of collusive complaints (Competition Commission Annual Report 2000:37).

- Competition Tribunal: According to section 26 of the Act of 1998 the Competition Tribunal is functioning within its jurisdiction of South Africa (The Competition Tribunal 2001:1). The Competition Commission can make a referral to the Tribunal or, in the case of a non-referral issued by the Commission, the complainant concerned may refer the matter directly to the Competition Tribunal (The New Act 2001:48). The functions of the Tribunal are to authorise or prohibit large mergers, grant exemptions and to adjudicate conduct prohibitions, i.e.

restrictive practices, as set out in Chapters 2 and 3 of the Act of 1998 (The Competition Tribunal 2001:1).

- The Competition Appeal Court: The Appeal court has a similar status than a High Court and functions within the legislative approval of section 36 of the Act of 1998. Any appeals or decisions from the Competition Tribunal may be reviewed by the Appeal Court and it may make a judgement that the circumstances require (The Competition Appeal Court 2001:1).

The prevalence of prohibited practices is indicative of the important role that Competition Authorities have to play in optimising production and distribution efficiencies. It is important, however, to take note that public interest and technological efficiency gains are incorporated into the interpretation of competition policy in South Africa. Even though a proposed merger could result in the substantial lessening of competition, if it is found that any technological or other pro-competitive gain is realised as a result of the merger that will offset the lessening of competition, such a merger may be granted (The New Act 2001:23).

As far as public interest is concerned, a serious consideration for the Competition Commission is the direct impact that the proposed merger will have on employment. Determining the actual number of job losses as well as the degree of black economic empowerment that would take place as a result of a proposed merger plays an integral role in assessing the social cost involved. An example of where the commitment of the Competition Commission to this particular element came out strongly was with the proposed merging of Nedcor Limited and Standard Bank Investment Corporation. After determining potential job losses of about 4000 employees, constituting a substantial social loss, the Commission could not justify any means of allowing the proposed merger to take place (Competition Commission Annual Report 2000:27).

The Competition Commission indicated in its Annual Report (2000:37) that the South African economy is highly concentrated. In the 1997 World investment Report of the United Nations Conference on Trade and Development it was mentioned that market dominance by a few major players is one of the critical deterrent factors discouraging foreign investors from investing in South Africa after the ending of sanctions (The Role of Competition Policy Guidelines 2001:3). The pivotal role that the

interpretation of the Structure, Conduct, Performance paradigm plays as a framework for applying competition policy cannot be under-estimated.

The Commission has endeavoured to construct a database on the structure-conduct-performance relationships in the manufacturing sector. The Commission states unambiguously, however, that although the SCP paradigm is used as an organising framework for their analysis, it does not imply that they assume a unidirectional causality between structure and performance (Competition Commission Annual Report 2000:45).

This chapter provides in-depth information of the SCP paradigm according to the structure provided in figure 1 (page 10). The study of the various determinants not only illustrates the characteristics of each, but also the possible linkages that could precipitate into restricted practices. In this regard the SCP paradigm provides the theoretical framework to aid regulatory bodies with the formulation of policy measures.

South African regulatory bodies play an important role, eradicating existing prohibited practices (table 6, p. 70) according to the assumptions made in the SCP paradigm. In many instances this line of conduct ensures competitive behaviour across the industries in the South African economy. The notion of reverse causality, however, questions the validity of the SCP paradigm.

These ideas, outlined in the beginning of this chapter, together with the study of the determinants of the SCP paradigm, emphasises the uncertainty surrounding the correct interpretation of the SCP paradigm. The extend to which this will impact South African policy makers will be discussed in Chapter 3. The existing theory regarding causality in the SCP paradigm will be used to take the South African causality debate a step further, including the long-term insurance industry.

## CHAPTER 3

### THE FORWARD REVERSE DEBATE - THEORIES AND APPLICATION

The work covered in this chapter is divided into two sections. The first section researches theoretical contributions by top industrial economics scholars in South Africa in an attempt to give an account of the argumentative evolution of the concentration-profits debate. The data used to develop arguments, either for or against forward causality, is based on the manufacturing sector.

The second section incorporates the theory of Chapter 2, indicating the theoretical importance of the determinants of the SCP paradigm. The applicable theoretical manipulations used by *inter alia* Reekie (1984) and Leach (1992b and 1997) in section 3.1 will then be used in a study of the long-term insurance industry. The purpose of section 3.2, however, is not to focus on the sector study, but rather on the elements of the SCP paradigm and the arguments surrounding causality.

Applying previous studies and shifting the emphasis from the manufacturing sector to the long-term insurance industry demands certain adjustments. Data acquired from the Financial Services Board (FSB) for the period 1990-1999 enables these adjustments, while also aiding with the formulation of required variables, e.g. Lerner- $eqv1$  and Lerner- $eqv2$  as measures of profitability. Developing an argument for or against forward causality with respect to the long-term insurance industry, given the available data and methodology, proves to be evasive. Results support the Structuralists' forward argument, however, due to the preliminary nature of this study, these results can not be accepted without acknowledging the need for further analysis.

### 3.1 THE MANUFACTURING SECTOR

In theory the SCP paradigm provides a basic framework for the interpretation and regulation of industry. In so far as research is concerned, the manufacturing sector have been dealt with thoroughly. Research provided proof in favour of the opposing Demsetz efficiency hypothesis and casts doubt on the application of deconcentration measures and competition regulation in general. This section will provide a theoretical background on the concentration-profits relationship and the development of this debate regarding the manufacturing industry.

The SCP paradigm serves as justification for the regulation or restriction of mergers and acquisitions. The underlying truth considered to be the basis for the SCP, as the only and uncontested mode of action, started to fade. At the centre of the argument lay the positive link between concentration and profitability. Demsetz led the attack against Bain's seemingly straight-forward causality assumption with the argument that profitability is not indicative of monopoly abuse but rather of superior efficiency (Fourie *et al.* 1998:558).

According to standard economic theory, when price exceeds marginal cost it is indicative of price setters in a concentrated market with sufficient barriers to entry. This price-setting behaviour contradicts the welfare maximisation criteria and leads to a misallocation of resources. The concept of comparing price and marginal cost created problems for empirical testing and forced SCP researchers to look at profitability as a measure of industry performance (Fourie *et al.* 1998:560). The expectation that supra-normal prices would culminate in supra-normal profits, however, proved not to be borne out.

Challenging the concentration-profits argument, multiple explanations came to the fore. Fourie and Smith (1998:562-570) looked at a few of these explanations:

- a) Brozen (1970) argued that the finding of Bain regarding the concentration profit causality cannot be correct due to the short-run nature of the study. He reconstructed Bain's 1951 study, using the same industries, but using a different time-frame (1953-1957) as opposed to the data used by Bain from 1936-1940. Brozen found that the concentration-profits relationship was statistically

insignificant. He concluded his finding by stating that Bain's 1936-1940 sample represented a period of disequilibrium. Of course, the short-run critique would also be applicable to this study by Brozen.

- b) The argument that monopoly profits are only a sign of superior efficiency proved to be one of the most influential criticisms against Bain and the followers of the market power argument. Demsetz did not try to disprove the concentration-profits relationship, but rather tried to explain the relationship on the basis of the efficient working of the market. The positive link between concentration and profitability is due to the superior efficiency of the large firms. The pressures associated with competition urge firms to seek higher levels of efficiency (economies of scale), which leads to increases in profitability and market share, which in turn leads to industrial concentration. The concentration-profits relationship therefore does not indicate the causal link.

According to Demsetz (1973) the causal chain runs from efficiency to increased market share and increased profitability. Work by Ravenscraft, Gale and Branch supported the view of Demsetz. They used Federal Trade Commission line of business and Profit Impact of Market Strategy data sets to measure market share at the individual firm level. Their study found that efficiency explained a greater proportion of profitability than market power did. The Demsetz efficiency-profits approach did not go unchallenged, as people like Porter later again indicated that the positive link between market share and profitability could be explained by abuses of monopoly power. Martin and later Clarke, Davies and Waterson, and Chapell and Cottle (1985) supported the idea that the market power and efficiency arguments were complementary rather than mutually exclusive.

- c) Fisher and Hall, and Bothwell, Cooley and Hall (1984) introduced a new perspective on the concentration-profits debate. According to them, the relationship between concentration and profitability could also be explained by risk. Due to the fact that highly concentrated industries are more capital intensive and necessarily more risky, one could argue that the higher risk in a project should be offset by higher returns. This viewpoint serves as another interpretation for a positive link between concentration and profitability.

d) Mancke (1974) did a study to challenge the proposed dynamics of the link between concentration and profits. He suggested that the positive association between concentration and profitability is the by-product of a random process. After building a simulation model, Mancke found that firm size, market share and past growth were positively correlated with rates of return. He concluded that chance factors were at work in the sense that “luckier” firms enjoyed greater gains and higher profitability in contrast with “unluckier” firms, which showed lower growth and profitability. In response to Mancke’s assumptions, Caves did a study which indicated that random effects only existed in a number of instances and were not sufficient to support Mancke’s work.

In identifying the opposing views, Fourie and Smith (1998:572-578) clearly indicated that the SCP paradigm has to contend with multiple causalities. The paradigm has to contend with the realisation that behavioural linkages are much more important than was suggested by the earlier version of the doctrine. They go a bit further with regard to the method of OLS (ordinary least squares) regression analysis and the fact that the level of concentration is likely to be endogenous. To be able to deal with the endogeneity, Geroski (1982) stated that for the concentration-profits test to be valid it is essential to employ a simultaneous equation approach. Another complication is that explanatory variables are not only dependent on each other, but may operate as elements of structure, conduct and performance.

These problems of endogeneity and simultaneity blur the lines of causality, which make it more difficult to specify a particular model's validity across a wide spectrum of industries. It is thus possible to discard the assumption that the concentration-profits relationship is homogeneous across industries. Empirical studies have shown that the underlying linkages between structure and performance differ from situation to situation and in various industry types. Some examples of the non-homogeneity across industries are cited in Fourie and Smit (1998:575-576):

- Comanor and Wilson (1967) and Collins and Preston (1969) showed that concentration-profits relationships are stronger in consumer good industries than producer good industries.

- Collins and Preston also indicated that the concentration-profits relationship responded differently to changes in the concentration levels. They found that the concentration-profits relationship was indeed stronger in consumer good industries with stable and increasing levels of concentration, while the relationship disappeared in consumer goods industries with declining concentration. Contributing to the complexity of the matter, they found that the profitability levels of industries in the producer goods industries were not influenced at all by concentration levels.
- The apparent division amongst intellectuals regarding the ambiguous role of concentration as indicator of market power or efficiency provides no foundation to expect the concentration-profits relationship to be uniform across all industries (Fourie *et al.* 1998:576).

Fourie and Smith (2001:25-56) used models created by Collins and Preston (1969), Comanor and Wilson (1967) and Weiss (1974) in an attempt to take the debate beyond the deadlock. They determined *inter alia* that there is little evidence to support the view that the concentration-profits relationship is stronger amongst consumer good industries. They also indicated that in industries with a CR4 greater than 50 percent, concentration plays a substantial role in explaining the concentration-profits relationship in South Africa. It is further suggested that in the industries with CR4 ratios below a 50 percent threshold, the link between concentration and profitability could be explained, in part, by efficiency.

Fourie and Smith (2001:56) conclude that the concentration-profits relationship, if studied by means of simultaneous equation analysis, is characterised by a number of bi- and multi-directional linkages and comprehensive lines of causality. According to Fourie and Smith (2001:56), "The debate must be re-orientated to focus on the nature of these multiple causalities".

### **3.1.1 Reekie and Leach, Determining Efficiency**

In the South African context W.D. Reekie and D.F. Leach challenged the forward causality argument using manufacturing sector data. Their subsequent attempts to



promote Demsetz's efficiency hypothesis as a superior interpretation of the causality debate provide important tools for sectoral analysis.

Reekie (1984:150-155) introduced South African data to the concentration-profits debate due to the importance of the matter to policy authorities, especially the Competition Board (today, the Competition Commission). He used the 1976 Manufacturing Census to draw a sample of 26, 3-digit manufacturing industries. Profitability was measured by Net Output less wages, expressed as a percentage of Gross Output. Reekie chose this measure because it is very close to the Lerner Index of  $(P-MC)/P$ . The measure for concentration that Reekie used was the number of firms accounting for at least 50 percent of industry sales.

*Table 7: Industry concentration and profitability*

	No. of firms accounting for at least 50% of sales	Profitability (%) (Net output less wages/gross output)
Food	76	18.7
Beverage Industries	11	19.7
Tobacco Products	1	23.1
Textiles	26	21.6
Wearing apparel, except footwear	60	19.2
Leather and leather products, leather substitutes and fur except footwear and wearing apparel	16	20.4
Footwear	12	19.1
Wood and Wood and cork products, except furniture	32	23.7
Furniture and fixtures, except primarily of metal	37	20.1
Paper and paper products	8	25.7
Printing, publishing and allied products	56	25.4
Industrial chemicals	7	22.9
Other chemical products	22	20.2
Rubber products	3	28.8
Plastic products not elsewhere classified	33	22.8
Pottery, china and earthenware	4	34.8
Glass and glass products	1	26.3
Other non-metallic mineral products	43	29.6
Iron and steel basic industries	6	27.7
Non-ferrous metal basic industries	4	23.3
Fabricated metal products except machinery and equipment	119	19.1
Machinery except electrical	54	19.1
Electrical machinery, apparatus, appliances and supplies		
Motor vehicles, parts and accessories	29	19
Transport equipment, except motor vehicles parts and accessories	33	13.4
Professional and scientific and measuring and controlling equipment not elsewhere classified, and photographic and optical goods	7	10
	6	30.4

*Source: Reekie 1984:152*

In his results (Table 7) he found the Spearman correlation coefficient of 0.634 and the corresponding t-statistic of 4.02 (significant at the 1% level). According to these results it would appear that concentration and profitability are indeed associated in the South African manufacturing industry. Reekie then took the data in Table 7, selected two subdivisions of 13 firms, with the more concentrated half showing a profitability of 24.01% and the less concentrated showing a profitability of 20.92% (Table 8). Reekie confirmed the belief regarding the concentration-profits relationship. Due to doubts about the conclusions that one can derive on the basis of the above validation of the SCP paradigm, Reekie did another exercise.

*Table 8: Sample industries*

No. of firms accounting for at least 50% of sales	No. of industries (26)	Average of industry average profit rates	Grouped average for 13 industries
1-3	3	26.1	-
4-6	4	29	24.01
7-16	6	19.6	-
22-32	4	21.1	-
33-43	4	21.5	20.92
54 or more	5	20.3	-

*Source: Reekie 1984:153*

Table 9 illustrates a three-by-three table with the seven highly concentrated, highly profitable industries in row 1. Row 2 contains the moderately concentrated and row 3 the diffused, less profitable industries. Considering the remarks made by Demsetz regarding reverse causality, i.e. the hypothesis that concentration facilitates collusion, smaller firms operating in concentrated industries should earn more than smaller firms elsewhere. No such correlation was found.

Rows 2 and 3 of table 9 is consistent with this argument. In row 1, however, the large concentrated firms are making a profit well above the average for their industry and for all industries. The fact that the other figures in row 1 (26.1 and 25.9) are below 28.7 can serve as a partial vindication of Demsetz's arguments, but due to the lack of a substantial difference it is not possible to disprove the SCP paradigm totally. Reekie thus indicates that the SCP model is partially vindicated in the South African setting.

*Table 9: Redefined sample industries*

No. of firms accounting for at least 50% of sales	No. of Industries	Grouped average return	Grouped average return by employment size group.		
			0-499	500-999	1000+
1-6	7	27.8	26.1	25.9	28.7
7-32	10	20.2	20.3	23.5	18.2
33 and over	9	20.8	21.1	23.8	20.9

*Source: Reekie 1984:154*

Commenting on the particular stance that government must take regarding regulation of the market structures, he argues that neither interpretation of causality can be accepted simplistically. The logical deduction given the data is that the causal relationship could be understood to flow in each direction simultaneously. Reekie concludes his 1984 article with a call for more research to be done regarding the concentration-profits relationship in South Africa.

Leach (1992b:144-153) reacted to the conclusion made in Reekie (1984) that the SCP hypothesis is "still fairly intact". Leach found more support for the Demsetz efficiency theory. He extended Reekie's analysis covering more years of data, utilising superior measures of concentration and bearing in mind the deficiencies of the data. The following paragraphs are a brief exposition of Leach's orientation, arguments and analysis.

According to Demsetz, merely indicating that the correlation between concentration and industry profitability is positive across industries will not distinguish between efficiency and monopoly power. This positive correlation could just be ascribed to the upward sloping marginal cost curves of the superior firms in an industry. Due to this upward curvature prices in an industry will not decrease sufficiently to defer potential entrants. However, the dominant firms will earn higher rates of return than entrants due to their superior efficiency. Demsetz indicated that instead of calculating one correlation coefficient between concentration and industry rate of return, at least two correlation coefficients should be calculated for small and large firms respectively. He proposed to distinguish between efficiency and monopoly power on

the basis of the following. Small firms in a colluding industry should earn rates of return that are equal to those of large firms, but only if they are able to produce at the same cost as the large firms.

If Demsetz's competitive view of industry structure holds – i.e. that the most efficient firms in an industry will gain market share which will lead to increasing industry concentration – then there should be a positive relationship between concentration and the rate of return only for large firms. After testing this argument and finding in favour of the competitive view, Demsetz concluded with the caution that industrial deconcentration would produce more inefficiency than it would eliminate.

After providing a short theoretical interlude on the views of Demsetz, Leach returned to Reekie's article. Remarking about Reekie's conclusions regarding Table 9, two main objections surfaced. There was no test for the statistical significance of the results, and Reekie seemed to have forgotten a severe deficiency in his data, namely that the employment size groups indicates size of plant and not size of the firm.

According to Leach this deficiency means that, under Demsetz's efficiency hypothesis, there will be a bias towards a positive relationship between concentration and profits for small employment size groups operated by large firms. Conversely then, there is a bias toward no relationship in the case of small firms operating large plants. If the above is correctly interpreted, it cannot serve as even a partial vindication of the SCP view. Leach proves this point through an expansion of Reekies' analysis to additional years of data.

To start his analysis Leach confirms the positive relationship between concentration and industry profitability. This relationship is consistent with both the monopoly hypothesis of the SCP paradigm and the efficiency hypothesis of Demsetz. The Rosenbluth index proved to be of superior statistical significance, and therefore Leach used only the Rosenbluth index as indicator of concentration for the remainder of his analysis. The measure of profitability used was the same as the one Reekie (1984) used in his analysis ((Gross Output- Cost of materials- Salaries and Wages)/Gross Output). Table 10 shows the results of the application of Demsetz's method on South African data. The results suggest that the correlation between profitability increases

with the size of the firm. The smaller the firm size in a particular class, the less statistically significant it seems to be.

*Table 10: Correlations between concentration and profitability by employment size class for South African 3-digit manufacturing industries: '72-'85.*

	1-19	20-99	100-499	500+	Industry
1972	0.165 (0.77) n=23	-0.034 (0.16) n=23	0.364* (1.75) n=22	0.192 (0.78) n=18	0.405* n=23
1976	0.122 (0.60) n=26	0.438* (2.39) n=26	0.135 (0.67) n=26	0.284+ (1.36) n=23	0.385* n=26
1979	0.126 (0.62) n=26	0.235 (1.19) n=26	-0.015 (0.08) n=26	0.340+ (1.58) n=21	0.488** n=26
1982	0.213 (1.05) n=25	0.259 (1.31) n=26	0.187 (0.93) n=26	0.421* (2.18) n=24	0.590** n=26
1985	0.119 (0.59) n=26	0.219 (1.10) n=26	0.306+ (1.57) n=26	0.279+ (1.39) n=26	0.401* n=26

Source: Leach 1992b:152

*n* = number of observations

\*\* Statistically significant at the 1% level (one-tailed test).

\*Statistically significant at the 5% level (one-tailed test).

+Statistically significant at the 10% level (one-tailed test).

( ) Absolute values of *t*-statistics

In conclusion Leach stated that the positive correlation between concentration and profitability reflects mainly a positive correlation for large firms, and there is little or no correlation for small firms. According to the SCP view, small firms in a colluding industry should do at least as well as large firms. But this was not the case. Alternatively, the Demsetz efficiency hypothesis seemed to be consistent with the results in respect of the fact that the concentration of the industry reflected the dominance of large low-cost firms. Leach rejected the SCP hypothesis in favour of the efficiency hypothesis. However, the use of the Demsetz test will be meaningful only for as far as the size of a firm is reflected in the size of the plant.

There is a more recent article by Leach which takes this whole debate a step further. Leach (1997:12-15) applied the Chappell and Cottle extension of the Demsetz test to distinguish between the monopoly explanation of the correlation and the efficiency explanation. The Chappelle and Cottle extension is not applicable to the forward-reverse study of the long-term insurance industry (section 3.2); however, the author included it due to the impact it has on the debate with respect to the manufacturing industry.

This extension refers to the implementation of an efficiency variable, the cost advantage ratio. The variable provided remarkable support for the Demsetz efficiency hypothesis.

Initially the efficiency variable, i.e. the cost advantage ratio, was used as an alternative way of revealing the effect of efficiency by means of regression analysis. The cost advantage ratio was defined as the value added per employee of the largest four firms divided by the value added per employee of the fifth through eight largest firms. In an industry-level regression analysis, however, a stronger relationship was found between concentration and profitability than between concentration and the cost advantage ratio which led to Chapell and Cottle's revised definition of the cost advantage ratio: the largest four firms' value added per employee divided by the small firms' value added per employee for the firms remaining in the industry.

Chapelle and Cottle introduced a second efficiency variable, namely Weiss's measure of minimum efficient scale (MES), defined as the midpoint plant size divided by industry output, to measure efficiency at plant level.

They estimated at industry level as well as by size class a regression without efficiency variables and found a positive relationship between concentration and profitability at the industry level and for the leading firm size class (ranked 1-4), but no correlation for smaller size classes. When they implemented the efficiency variables in their regression, they obtained the same results. Furthermore, the positive relationship between concentration and profitability disappeared, indicating that an estimation of the concentration-profit relationship without the efficiency variables simply highlights the effect of the efficiency variables. Chapell and Cottle's use of Weiss's MES was criticised and it was pointed out that MES might reflect monopoly power as well as efficiency. Leach's study therefore concentrated just on the cost advantage ratio as the one control necessary for efficiency.

Leach (1997: 15-22) applied the Chapell and Cottle extension to South African data for 26 3-digit manufacturing industries for 1982, 1985 and 1988 (tobacco excluded). He estimated all the official measures of concentration as published by the Central

Statistical Service. This included the four- and ten-firm concentration ratio, Herfindahl-Hirschmann index, the Rosenbluth index and the Hovarth Index. As a measure for profitability Leach employed the South African equivalent for the price-cost margin that is used in US concentration profits studies. This is defined as (gross output minus cost of materials – salaries and wages)/ gross output. The price cost measure was used by Leach as a crude measure.

To some extent Leach corrects the deficiencies of the price-cost margin through adding control variables. The industries' capital intensity (capital divided by gross output) and advertising intensity (advertising divided by gross output) were added to the regressions. The implementation of these two control variables will, according to Leach, also increase the quality of the cost-advantage ratio, because a change in these intensities by size of firm will cause deviations in the value added per employee that are unrelated to efficiency. The data for Capital, defined as the sum of fixed assets and stocks, advertising and imports were collected from the Central Statistical Service (Statistics South Africa). The import-sales ratio (imports divided by gross output) was also included to account in some measure for the degree of foreign competition.

Leach was limited to the extent that data were not available by size of firm, so he had to use data according to plant size to apply the Demsetz test. This deficiency will yet again lead to the results being biased against the Demsetz efficiency hypothesis. This also led to the cost-advantage ratio being available only at plant level. For South African data Leach calculated the value added per employee to be (gross output – cost of materials)/paid employees. Leach further converted the absolute employment size classes to relative size class data through dividing average gross output per plant by industry output. Three relative size classes were created: small plant size (average gross output per plant less than 0.1% of industry output), medium-size class (between 0.1% and 1% of industry output) and large-size class (greater than 1% of industry output).

In order to isolate the suitable measures of concentration, Leach tested for the positive correlation between profitability and concentration for each individual measure. His results are shown in Table 11. The results confirm a positive correlation between profitability and all measures of concentration for all the specified years. Leach

isolated the Rosenbluth Index (RI) and the four-firm concentration ratio as being statistically superior pertaining to the specified data. He chose to continue only with the well-known four-firm concentration ratio, as the RI yields the same results.

*Table 11: Correlations between concentration and industry profitability for 26 South African 3-digit manufacturing industries: 1982, 1985 and 1988*

Years	Price – Cost Margin		
	1982	1985	1988
Four-firm concentration ratio	0.402* (2.15)	0.474* (2.64)	0.594** (3.62)
Rosenbluth Index	0.569** (3.39)	0.402* (2.15)	0.564** (3.34)
Herfindahl – Hirschman Index	0.344+ (1.79)	0.416* (2.24)	0.495** (2.79)
Hovarth Index	0.373+ (1.97)	0.437* (2.38)	0.542** (3.16)

*Source: Leach 1997: 17*

*Notes: Numbers in parenthesis are t statistics*

*\*\*Significant at 1% level (two-tailed test)*

*\*Significant at the 5% level (two-tailed test)*

*+Significant at the 10% level (two-tailed test)*

Leach first applied the Chappell-Cottle extension of the Demsetz test to South African data, excluding the efficiency variable from the regressions. His results are illustrated in Table 12. The table shows that concentration is significant for all three years at the 5% level for the industry and large-size plants, and insignificant for the medium- and small-sized plants. Table 12 supports Demsetz in the sense that the positive relationship between concentration and profitability at industry level reflects only the positive relationship for large firms. The results support the Demsetz efficiency hypothesis as opposed to the SCP monopoly hypothesis even though they are biased against the Demsetz hypothesis.

The import-sales ratio has the expected negative sign, except for the small-size class, and the coefficient for advertising yields the expected positive sign in each case, but to the surprise of Leach are not statistically significant for most regressions. The coefficient for capital intensity is insignificant and has a negative sign for the large class size and for two of the three industry regressions. The coefficient is positive for the small- and medium-size class, but is significant only in 1988. These results



regarding the capital intensity correspond with findings of US studies in the sense that capital-intensive industries performed badly in the 1980s.

*Table 12: Estimates of a Conventional Specification of the Concentration-Profits relationship for South African 3-digit Manufacturing Industries: Industry and Plant Size Regressions for 1982, 1985 and 1988*

	Dependent Variable: Price-Cost Margin			
	Industry	Large Plants	Medium Plants	Small Plants
<b>1982:</b>				
Constant	19.34	24.79	17.48	14.89
Concentration	15.81* (2.08)	16.34 <sup>+</sup> (1.47)	3.49 (0.66)	4.05 (0.50)
Import-Sales Ratio	-2.25 (1.22)	-3.35 (1.27)	-0.37 (0.29)	1.32 (0.77)
Capital Intensity	-4.40 (0.49)	-11.45 (0.89)	3.88 (0.62)	9.39 (1.09)
Advertising Intensity	223.8 (0.95)	154.3 (0.45)	312.3* (1.91)	37.7 (0.17)
R <sup>2</sup>	0.250	0.159	0.206	0.169
Sample Size	26	25	26	25
<b>1985:</b>				
Constant	17.79	19.06	18.92	17.50
Concentration	17.08* (2.47)	20.58* (2.03)	2.26 (0.37)	3.41 (0.55)
Import-Sales ratio	-1.25 (0.58)	-2.29 (0.74)	-0.12 (0.06)	1.28 (0.67)
Capital Intensity	-2.27 (0.38)	-5.57 (0.65)	2.41 (0.46)	3.0 (0.56)
Advertising Intensity	168.6 (0.83)	254.2 (0.85)	190.3 (1.07)	124.1 (0.68)
R <sup>2</sup>	0.264	0.207	0.073	0.093
Sample Size	26	25	26	26
<b>1988:</b>				
Constant	17.63	24.07	17.49	10.72
Concentration	17.86** (3.02)	16.07* (1.81)	-2.87 (0.59)	-2.20 (0.31)
Import-Sales Ratio	-0.99 (0.66)	-2.27 (1.00)	-1.17 (0.94)	0.54 (0.29)
Capital Intensity	0.39 (0.05)	-6.84 (0.61)	12.80* (2.09)	19.29* (2.14)
Advertising Intensity	85.4 (0.53)	168.7 (0.69)	139.1	301.6 <sup>+</sup> (1.54)
R <sup>2</sup>	0.371	0.185	0.246	0.291
Sample Size	26	25	26	25

Source: Leach 1997:19

Notes: Because of missing values, the large-size class for Food for all census years and the small-size class for Glass for 1982 are excluded. Numbers in parenthesis are *t*-statistics (absolute value). The significance of capital intensity is evaluated by a two-tailed test. All other variables are evaluated by a one-tailed test.

\*\*Significant at 1% level

\*Significant at 5% level

+Significant at 10% level

Table 13 shows the results after Leach applied the efficiency variable cost advantage ratio. The results indicate positive coefficients of high statistical significance and high R squares in the case of the cost advantage ratio for large size class firms and the industry. In addition, including the efficiency variable makes concentration statistically insignificant. In line with the Demsetz hypothesis the coefficients of the price cost ratio show significance with regard to the industry and large-size industries

and insignificance with regard to the small- and medium-sized firms. The statistical insignificance of concentration as well as the pattern of the cost advantage ratio clearly suggest that including concentration without the efficiency variable just emphasises the effect of the efficiency variable.

*Table 13: Estimates of the Conventional Concentration-Profits Relationship controlling for the Cost Advantage Ratio for South African 3-digit manufacturing industries: industry and plant size regressions for 1982, 1985 and 1988*

	Dependent Variable: Price-Cost Margin			
	Industry	Large Plants	Medium Plants	Small Plants
<b>1982</b>				
Constant	5.16	4.16	17.01	7.88
Concentration	-1.42 (0.19)	-7.08 (0.68)	2.05 (0.30)	-2.89 (0.31)
Import-Sales Ratio	-0.17 (0.11)	-0.24 (0.11)	-0.34 (0.24)	2.29 (1.25)
Capital Intensity	5.61 (0.73)	2.57 (0.25)	4.50 (0.65)	13.65 (1.53)
Advertising Intensity	349.7* (1.80)	2.99.6 (1.13)	336.8* (1.91)	85.0 (0.38)
Cost Advantage Ratio	10.57** (3.71)	15.13** (3.89)	0.48 (0.19)	5.15 (1.53)
R2	0.562	0.532	0.213	0.255
Sample Size	25	25	25	24
<b>1985</b>				
Constant	10.93	7.75	18.30	17.66
Concentration	-1.51 (0.21)	-8.89 (0.99)	-0.54 (0.06)	3.11 (0.36)
Import-Sales Ratio	-0.75 (0.44)	-1.39 (0.67)	-0.14 (0.07)	1.22 (0.60)
Capital Intensity	0.21 (0.05)	-1.43 (0.25)	2.59 (0.47)	2.92 (0.52)
Advertising Intensity	14.8 (0.09)	-11.0 (0.05)	187.6 (0.96)	134.9 (0.67)
Cost Advantage Ratio	9.96** (3.85)	16.05** (5.05)	1.24 (0.41)	-0.01 (0.00)
R2	0.582	0.661	0.084	0.088
Sample Size	25	25	25	25
<b>1988</b>				
Constant	9.45	12.24	17.22	5.89
Concentration	-0.76 (0.11)	-9.90 (0.94)	-3.41 (0.45)	-13.22 (1.25)
Import-Sales Ratio	-0.19 (0.15)	-1.04 (0.56)	-1.13 (0.84)	1.01 (0.54)
Capital Intensity	4.57 (0.74)	-0.47 (0.05)	12.96+ (1.96)	21.75* (2.35)
Advertising Intensity	79.1 (0.60)	143.5 (0.72)	137.8 (0.97)	289.3+ (1.50)
Cost Advantage Ratio	8.83** (3.60)	12.43** (3.39)	0.27 (0.10)	5.22 (1.42)
R2	0.622	0.492	0.246	0.358
Sample Size	25	25	25	25

Source: Leach 1997:20

Notes: Because missing values, the large size class for Food for all census years and the small size class for Glass for 1982 are excluded. Numbers in parenthesis are *t* statistics (absolute value). The significance of capital intensity and the cost advantage ratio are evaluated by a two-tailed test. Other variables evaluated by a one-tailed test.

\*\*Significant at the 1% level

\*Significant at the 5% level

+Significant at the 10% level

Leach's concluding remarks clearly indicate that the South African manufacturing data of the 1980s strongly supports the Demsetz efficiency hypothesis. The results are also concordant with actual monopoly power in the South African economy.

According to Leach, the root of this monopoly power cannot be eradicated via a deconcentration policy, which will only destroy large firms' efficiency, but only by raising concerns regarding government protection i.e. high tariffs.

Leach's application of the Chappelle-Cottle extension to the Demsetz efficiency hypothesis supports Demsetz's interpretation of the concentration-profits causality debate with regard to the manufacturing sector. Thus as far as the manufacturing sector is concerned, the arguments surrounding the debate have shown convincingly that the SCP paradigm as theoretical framework for deconcentration justification could be questioned.

The lack of research in the services sector with respect to the concentration-profits debate motivates the application of the research theories tested on the manufacturing sector to the financial services sector and more specifically the long-term insurance industry.

### **3.2 THE LONG-TERM INSURANCE INDUSTRY**

The insurance industry plays an important role in the South African economy and contributed 2.2% to GDP in 1999. The industry is an important provider of employment and employed 64 373 people in 1999 (FSB Annual Report 1999:10). Market capitalisation of long-term insurers on the JSE amounted to R123 billion during June 2000. Sanlam and Old Mutual contributed R64 billion after their consecutive listings on the JSE (FSB Annual Report 1999:11).

The importance of this sector and other industries of the tertiary sector in the economy is not expressed through the research being done to determine their proper regulation. This section will aim to provide some information on the structure of the long-term insurance sector as well as give some evidence as to how the concentration-profits debate could influence the regulatory approach.

The long-term insurance industry is subjected to continuous regulation by the Financial Services Board as determined by the Long-term Insurance Act 52 (1998). The data gathered from insurance firms registered with the Financial Services Board will be used to do an analysis to establish the relevance of the SCP paradigm as a framework for the application of competition policy. Establishing SCP on a theoretical basis using it as “hat rack” is not enough. The forward-reverse causality debate will feature in the analysis in an attempt to find a satisfactory interpretation.

Competition analysis is important to ensure justifiable levels of market power, hence preventing abnormal profits and the accompanying allocative and production inefficiencies. SCP plays an integral role in these arguments and therefore the intuitive place to start the analysis is with the market structure. Time-series data from 1990 to 1999 as set out in the Annual Reports of the Registrar of Insurance were used.

### 3.2.1 Market Definition

For the purposes of market definition an overview of the long-term insurance industry is provided. In June 2000 the number of long-term insurers registered was 57, a 72% increase in registered insurers since 1990, when only 33 insurers were registered (FSB Annual Reports). This indicates relative ease of access to the industry. The barriers to entry will be discussed in a later section on entry analysis. The market shares of the direct long-term insurers are shown in Table 14.

*Table 14: Market shares of insurers determined by gross written premium*

No	1990		1995		1999	
	Short name	Market share	Short name	Market share	Short Name	Market Share
1	Sanlam	35.2706	Sanlam	33.2470	Old Mutual	25.9751
2	SA Mutual	31.1730	SA Mutual	31.6538	Sanlam	16.0289
3	Liberty life	8.9381	Liberty Life	10.3426	Liberty Life	9.0639
4	Southern Life	7.1696	Southern Life	6.0473	Forbes Life	8.2688
Total		82.5514		81.2907		59.3367
Rest		17.4486		18.7093		40.6633

*Source: Author's calculations based on FSB Annual Reports*

This is merely an introductory overview of the four-firm concentration ratios and the market shares of the remaining insurers as listed in the Financial Services Boards (FSB) Annual Reports. In this preliminary table it is already evident that rather high levels of concentration exist, but that a notable decrease has occurred insofar as the four-firm concentration ratio is concerned.

Income in the long-term insurance industry is generated from two sources, underwriting income and investment income. Underwriting income is generated from the sale of policies. Investment income is a very important component of the insurers' income, but is highly correlated with macro-economic indicators, i.e. interest rates, etc. (FSB Annual Reports). A breakdown of income generated in the long-term insurance industry over the relevant time period is depicted in Table 15. The slump in investment income in 1999 was due to declining interest rates and a decrease in government stock holdings (FSB Annual report 1999:1)

*Table 15: Break down of underwriting and investment income*

<b>Income (R'm):</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>
Net premiums	21 807	24 523	31 217	38 378	46 079	61 772	68 402	82 474	114 517	115 539
%Change		12%	27%	23%	20%	34%	11%	21%	39%	1%
Investment income	10 584	12 029	13 844	15 455	17 727	23 174	25 841	28 994	36 010	31 963
%Change		14%	15%	12%	15%	31%	12%	12%	24%	-11%

*Source: Author's calculations based on FSB Annual Reports*

Underwriting income could be separated into the following classes:

- periodic premiums (PP)
- single premiums (SP)
- immediate annuities (IA)
- retirement annuity fund (RA)
- long-term disability business (LtD)
- pension fund and group life (PG) (FSB Annual report 1999:4).

These income/business classes are extremely important and can influence the way in which the market will be defined. For the purpose of further analysis gross written premium income, constituted by the indicated income classes, will be used.

In accordance with US merger guidelines (1992:2) the Competition Commission evaluate and define relevant product and geographic markets through the application of the following test:

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-maximising 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 are held constant (US Merger Guidelines 1992:3).

The relevant market would then refer to a group of products and a geographic area that is no bigger than necessary to satisfy the above-mentioned test. The relevant market is thus determined by the demand responses of the consumer, should this hypothetical monopolist exercise market power, i.e. the price increase could be rendered unprofitable should consumers switch to other products or switch to the same products produced by firms at other locations.

The geographic market in this case is the whole of South Africa. Given the assumption of a possible merger between two South African-based long-term insurers, the geographic market, i.e. the whole of South Africa, is sufficient. This is applicable due to an extensive network of brokers and as ever-increasing telecommunications media provide ease of access anywhere in South Africa. Furthermore, legislation requires insurers who operate within the borders of South Africa to be registered in accordance with the Long-term Insurance Act No. 52, 1998 (RSA 1998:20).

Defining the relevant product market would imply that in the case of a hypothetical merger between two firms in the long-term insurance industry, one could consider the following:

- defining separate markets for each type of long-term insurance product, or in this case premium income-generating field of business;
- defining a single market for all long-term insurance products (Competition Tribunal 2000:2).

The first approach would mean to define a relevant market for each of the different sources of underwriting income as set out above. Not all firms registered generate an income from all identified sources in Table 16. Table 16 illustrates this by indicating the break-down of registered firms involved in the different fields.

*Table 16 : Break-down of firms involved in the different fields of income*

Date	Pension fund and group life business	Retirement annuity fund business	Immediate annuities	Long-term disability insurance	Single premiums	Periodic premiums	Total
1990	22	21	16	14	18	29	32
1999	26	18	20	15	24	36	50

*Source: Author's calculations based on FSB Annual Reports*

Aligning this information with the test mentioned above would imply the following: if a hypothetical monopolist increases the price of a product that generates an income for one of the specified fields, assuming the terms of sale of other products remain constant, will there be a suitable substitute available? If so, the consumer will

automatically make a substitution to evade the price hike. If this is possible, the market has been defined too narrowly and the substitute should be included in the product market definition. This specific definition of the different income groups will become clearer when the market shares and concentration levels are evaluated.

The second method mentioned entails the defining of a single market. To be able to define the long-term insurance market as one single market, the probability of supply-side substitution between various products classes must be investigated (Competition Tribunal 2000:3). According to the FSB, extension of a product line within a specified class can be accomplished easily; however expanding to another class would entail an application process at the Financial Services Board. If the applicant satisfies the requirements of the Registrar, registration as long-term insurer will commence. Thus, even though expansion of a product class entails a registration process, such an activity is possible. Therefore defining the long-term insurance market on the basis of a single product market could be justified.

### **3.2.2 Market Shares and Concentration Levels**

The author used gross written premiums (sales value) to calculate market shares. This method is commonly used in the literature on the insurance industry (Theron 2000:7). Calculations were made with the two definitions mentioned in mind. The total gross written premium income of the various long-term insurance firms were used to calculate concentration measures for a period of ten years (1990-1999). Table 17 illustrates these figures.

The absolute measures employed were the four-firm (CR4) and ten-firm (CR10) concentration ratios. The Gini-coefficient was the only relative measure used. Three types of summary measures, i.e. the Herfindahl-Hirschmann index (HHI), the Rosenbluth index (RI) and the Hovarth Index (HI) were also utilised to measure concentration levels. The concentration measures in Table 17 were made under the assumption of defining the long-term insurance market as a single market and total gross premium income was used.



*Table 17: Concentration measures calculated from total premium income.*

Year	CH4	CH10	HHI	RI	Gini	HI
1990	0.8255	0.9671	0.2389	0.2009	0.8445	0.5502
1991	0.8086	0.9660	0.2241	0.1910	0.8414	0.5256
1992	0.8157	0.9647	0.2329	0.1971	0.8550	0.5422
1993	0.8227	0.9643	0.2301	0.1924	0.8472	0.5385
1994	0.8102	0.9708	0.2143	0.1903	0.8454	0.5160
1995	0.8129	0.9696	0.2307	0.1977	0.8703	0.5395
1996	0.7710	0.9595	0.1997	0.1754	0.8610	0.4932
1997	0.7370	0.9354	0.1918	0.1521	0.8735	0.4795
1998	0.6722	0.8873	0.1931	0.1284	0.8530	0.4696
1999	0.5934	0.9028	0.1271	0.1150	0.8447	0.3723

*Source: Author's calculations based on FSB Annual Reports.*

Before any further comments are made on the levels of concentration compared to other South African data the author would like to point out the deficiency of the Gini-coefficient in regarding the data as shown in Table 17. The tables used in the FSB Annual Reports add newly registered firms to their list every year; however, income data and therefore market shares are not added as no such data are yet available. This process created a tendency towards a superficially high Gini-coefficient. The formula used to calculate the Gini-coefficient was:

$$Gini = 1 - 1/RI \times N \text{ (Leach 1997:16).}$$

It is thus clear that an increase in N (number of firms) would superficially increase the Gini without having an effect on true market share. The formulas and theoretical structure of the other concentration measures used are explained earlier in Chapter 2.

Gathering information on the concentration levels of an industry is essential for implementation of deconcentration policy, as part of competition regulation, to prevent monopoly power. To ease the interpretation of the data in Table 17, a comparative table is included. Table 18 indicates different measures of concentration for the manufacturing industry for three periods compared with the average of the different concentration measures of the long-term insurance industry over the ten-year period. It is rather apparent that high levels of concentration existed in the long-term insurance industry over the ten-year period. Smith and du Plessis (1996:7)

determined the following guidelines regarding four-firm concentration levels in the manufacturing industry:

- 70%, High concentration
- 50-69%, Concentrated
- 25-49%, Slight concentration
- less than 25%, Unconcentrated

Table 18 indicates clearly that the average concentration measures calculated by means of gross written premium income are comparatively much higher than the measures calculated for the manufacturing index based on total sales income (gross output). The difference in the average number of firms used to perform the calculation may have had a detrimental effect on comparing the Rosenbluth index of the different industries with each other. In 1988, for example, the average number of firms used to calculate the concentration measures in the manufacturing industry was 111 and the average number of firms used to measure concentration in the long-term insurance industry was 39. Due to the definition of the Rosenbluth index and the method used to calculate this index, N, number of firms used play an integral role, and provide a reason for the higher value in the long-term insurance industry.

*Table 18: Concentration measures at 5-digit level for the manufacturing industry compared to averages of Lt-insurance industry*

	1982	1985	1988	Average
CR4	0.594	0.607	0.612	0.7669
CR10	0.768	0.773	0.779	0.9487
HHI	0.170	0.184	0.170	0.2083
HI	0.390	0.401	0.395	0.5027
RI	0.127	0.141	0.133	0.1740

*Source: Smith and du Plessis 1996:10, and author's calculations*

Even though arguments could be made against a simplistic comparison of concentration levels in the long-term insurance industry and the manufacturing industry of South Africa, the important issue at hand is that the concentration levels in the long-term insurance industry are high. However, a comparison between homogenous industries to establish the level of concentration in the South African

long-term insurance industry relative to the same industry in another country would be preferential.

*Table 19: Comparative concentration measures between the UK life industry and the South African long-term insurance industry*

	UK 1996	SA 1996
CR5	0.295	0.875
CR10	0.43	0.975
HHI	0.028	0.227

*Source: Hardwick and Adams 1999:8 and author's calculations from FSB Annual Reports*

In Table 19 a comparison is made between concentration measures CR5 (top five firms), CR10 (top ten firms) and the Herfindahl-Hirschmann Index. The concentration measures in Table 19 were calculated by means of asset shares of respective insurers. Table 20 shows the comparison between the UK life insurance industry and the South African industry based on gross written premium. Again a substantial difference is apparent for the five years. A comparison with another developing country would have been the ideal; however data regarding financial services are very difficult to obtain. The UK was therefore chosen for this comparison due to the availability of relevant data..

*Table 20: Comparison of concentration measures in the UK and South African long-term insurance industries over a five-year period.*

Country Cons. Measure	UK			SA		
	CR4	CR10	HHI	CR4	CR10	HHI
1995	0.2962	0.5277	0.0391	0.8129	0.9696	0.2307
1996	0.3067	0.5438	0.0415	0.7710	0.9595	0.1997
1997	0.2941	0.5258	0.0382	0.7370	0.9354	0.1918
1998	0.3055	0.5379	0.0398	0.6722	0.8873	0.1931
1999	0.3388	0.5746	0.0449	0.5934	0.9028	0.1271
Average	0.3083	0.5420	0.0407	0.7173	0.9309	0.1884

*Source: Author's calculations based on data from Theys and FSB Annual Reports*

It is thus quite apparent that, irrespective of the comparison, be it the South African manufacturing sector or the UK life insurance industry, the South African long-term insurance industry exhibits high levels of concentration. According to Phillip Langenhoven (2001) from the FSB, these high levels of concentration can be ascribed

to historical reasons, namely that the main market shareholders (Table 14) have been in the long-term insurance business in South Africa for a longer period on average than the smaller market shareholders. The firms with substantial market shares are also involved in more product classes than many of the smaller players, who focus their attention on niche markets.

Figure 19 illustrates the above-mentioned tendency of the smaller firms to focus on a niche market, using only certain products. About 70% of the top ten total earners of gross written premiums are involved in all the income classes. The rest of the firms' involvement varies and continuously falls below the involvement levels of the larger firms. Clearly with regard to competition regulation and the defining of the relevant product market, some consideration must be given to definition one, i.e. defining different markets for the product classes rather than one market.

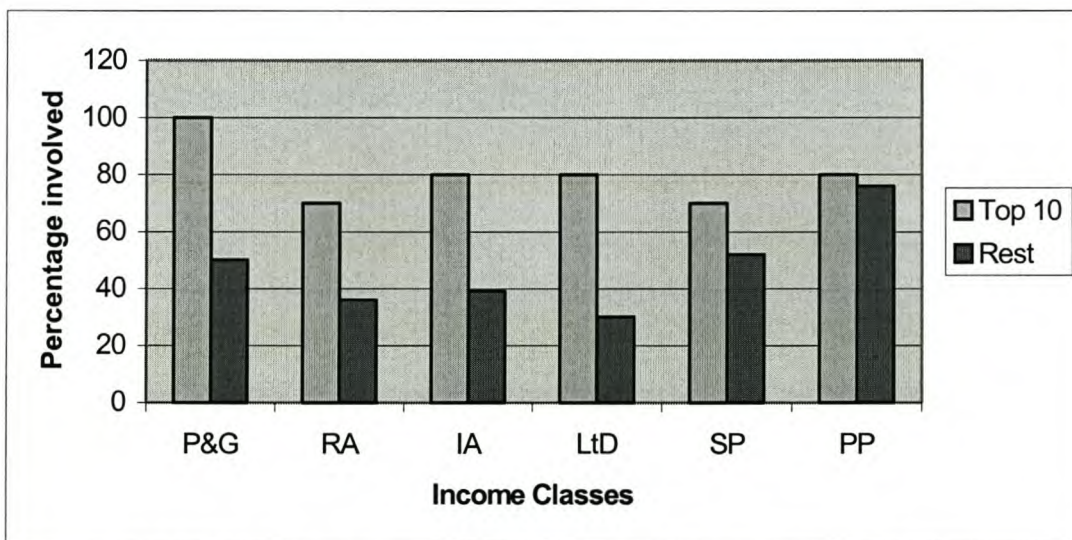


Figure 19: Percentage of top ten and rest of insurers involved in all income Classes during 1999.

Source: Author's calculations based on FSB Annual Reports

Figures 20 to 24 indicate the levels of concentration pertaining to the different income classes for the period 1990-1999. The reader must note that different scales are used for the respective concentration measures and though some deviations might seem extreme, this is due to amplification as a result of the different scales utilised. It is clear that the concentration levels vary with regard to the separate income or product classes. The fact that the various income/business classes clearly differ regarding

measured concentration levels indicates the importance of defining the relevant product market before a hypothetical merger can be prohibited by the competition authorities. The following is a key to the abbreviations used in the figures. The first part indicates the concentration measure used and the second part the specific income/product class.

- **ch10IA**: The ten-firm concentration ratio for the class of immediate annuities.
- **ch4PG**: The four-firm concentration ratio for the class of pension fund and group life business.
- **hhiPP**: Herfindal-Hirschman Index for the class periodic premiums.
- **hiRA**: Hovarth index for the class retirement annuity fund business.
- **riSP**: Rosenbluth Index for the class single premiums.
- **LTD**: Income class for long-term disability insurance business.

There is a general trend which will become clearer when the different measures are shown on one set of axis. Figures 20 and 21 illustrate that the market power is consolidated in the top ten firms over all six income classes; however, for the top four firms concentration varies considerably. The rest of the figures show the summary measures which take all the firms into account. Fairly substantial differences in concentration are visible. These figures provide strong evidence in favour of individual product market research, where applicable, to ensure that competition regulation can be implemented justly. This supports the first definition.

Figures 20 to 24 sketch a picture of predominantly high levels of concentration in the respective income classes of the long-term insurance industry of South Africa. The apparent lack of correlation between levels of concentration given a specific concentration measure supports definition one of the relevant product market definition.

In the case of the short-term insurers, Santam Limited and Guardian and National Insurance Company Limited, it was found that even though the first product market definition is consistent with international practice, the broader second definition may also be justifiable as long as there is sufficient supply-side substitution (Competition Tribunal 2000:3). As explained previously, in accordance with the regulations of the

FSB and the Long-term Insurance Act 52 (discussed in the section on entry analysis), supply-side substitution can take place with relative ease.

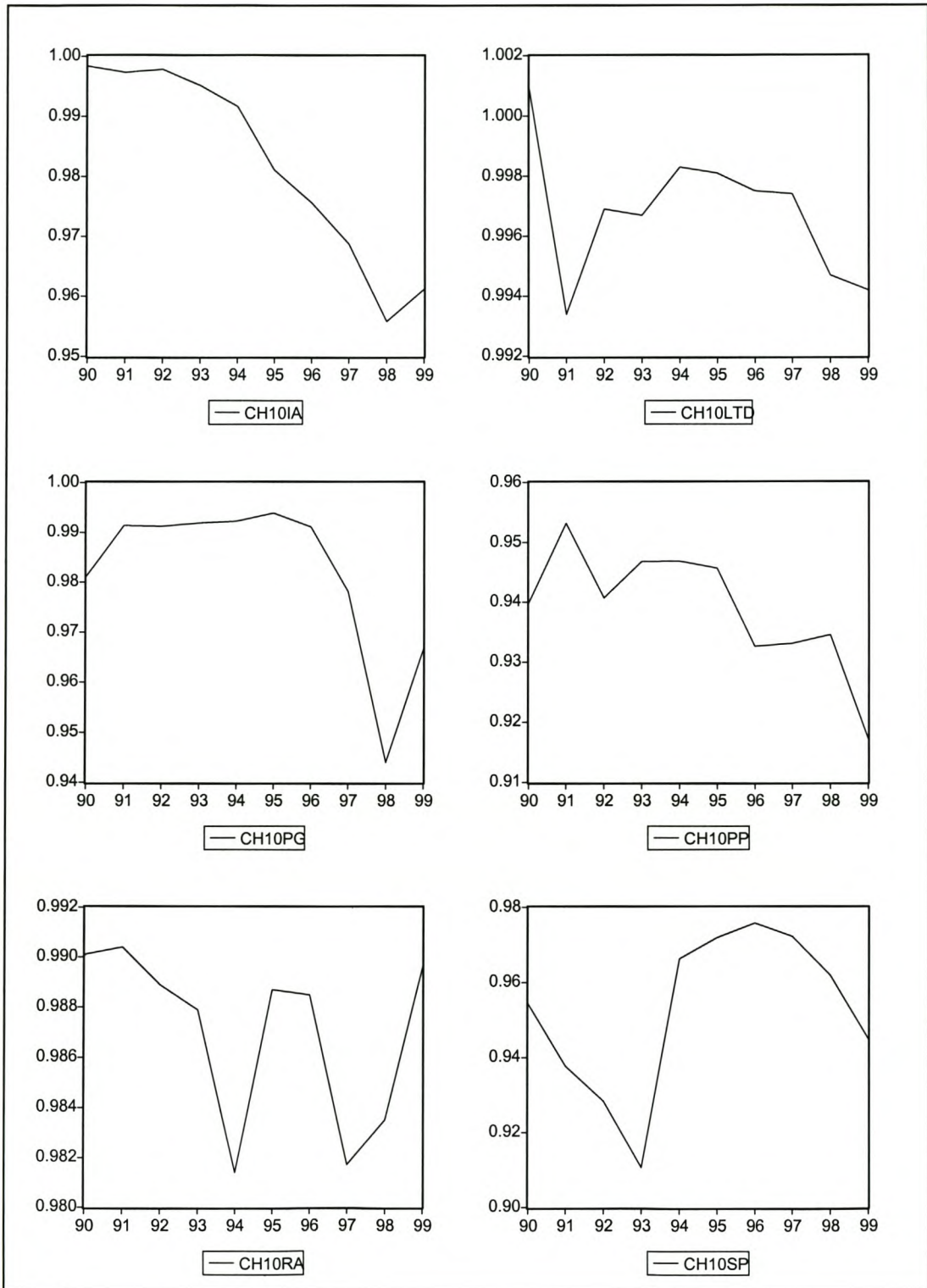


Figure 20: Ten-firm concentration ratio for the different income classes.  
 Source: Author's calculation from FSB Annual Reports

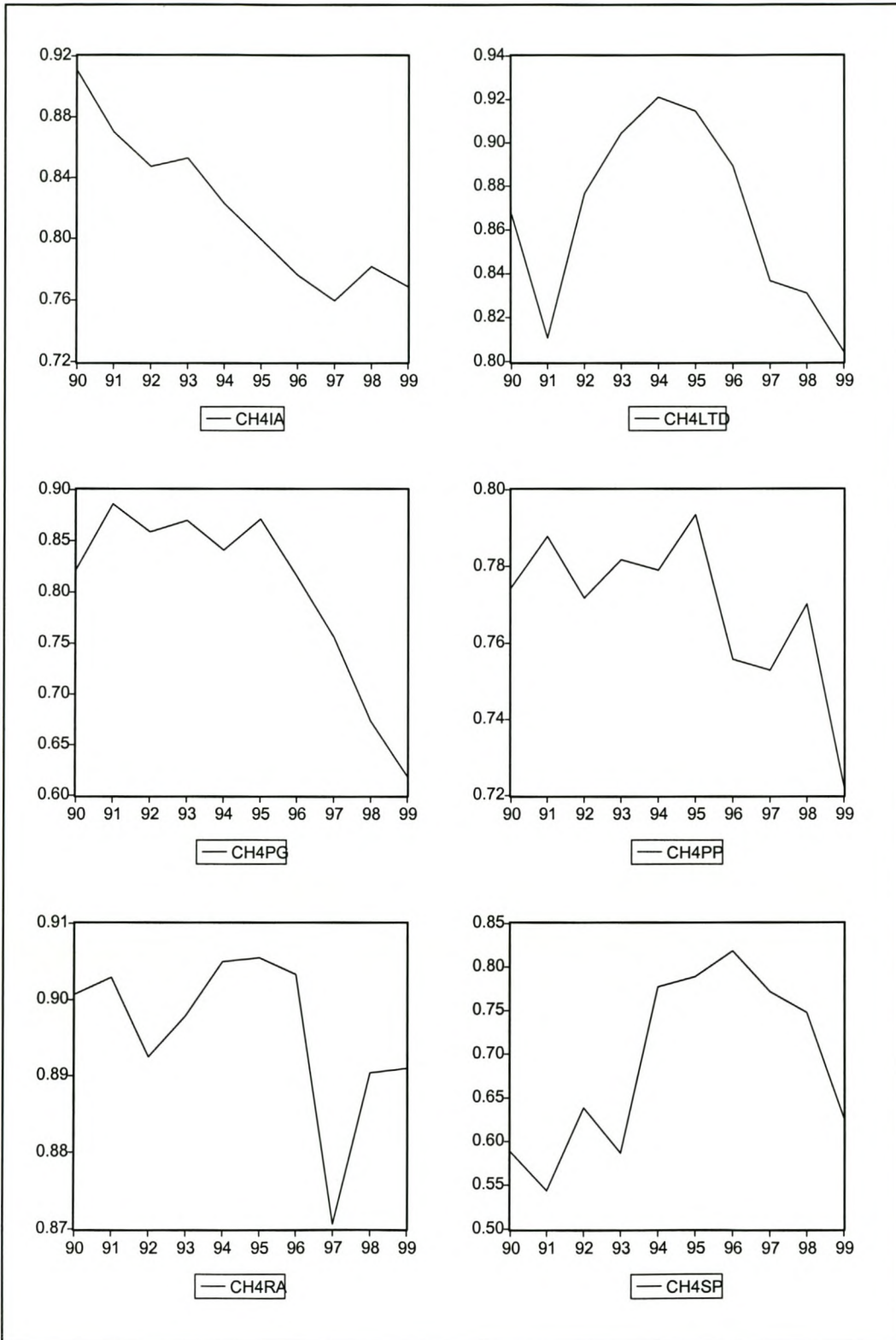


Figure 21: Four-firm concentration ratios of the different income classes.  
 Source: Author's calculations based on FSB reports.

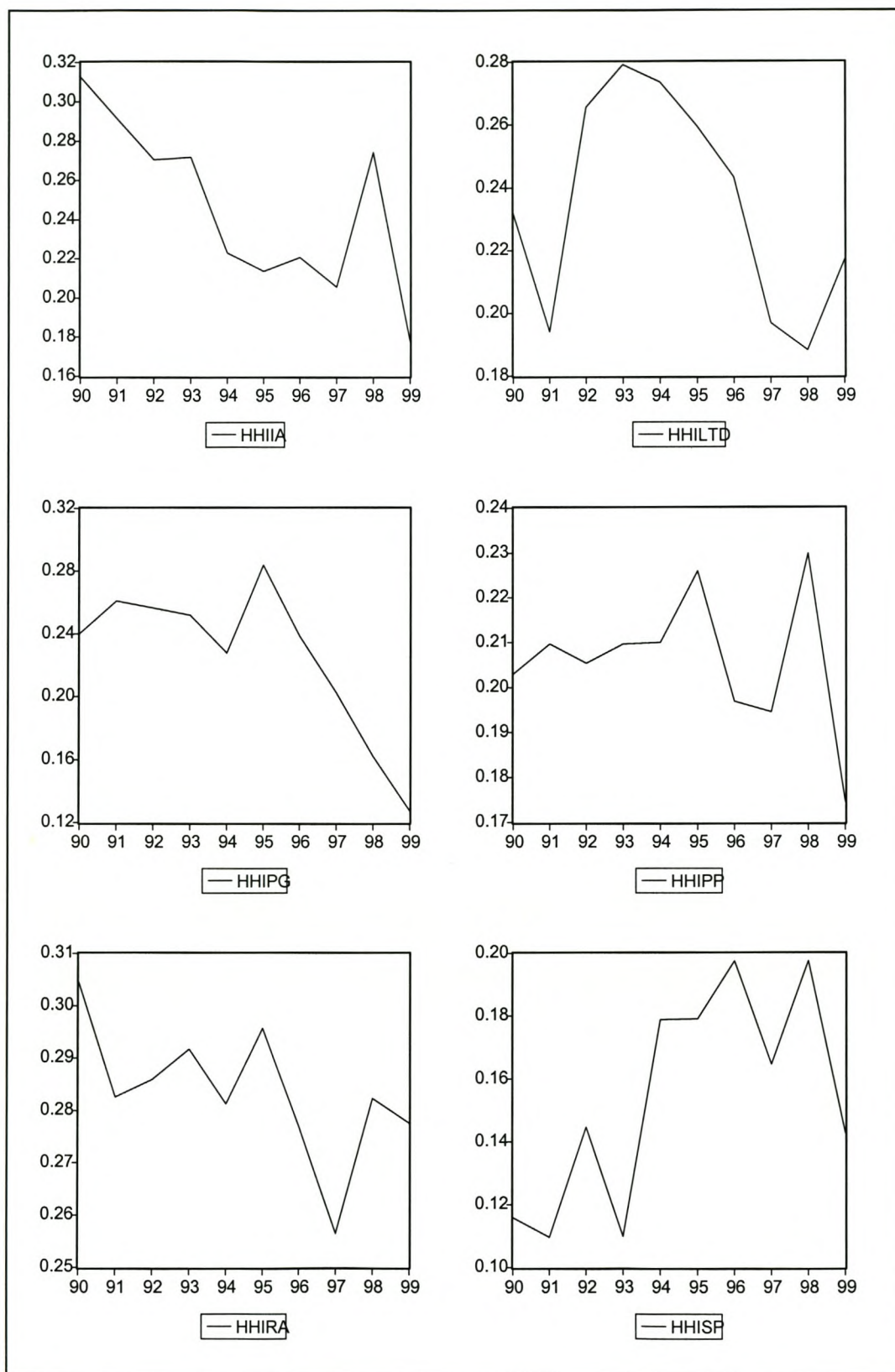


Figure 22: Herfindahl-Hirschmann Index for the different income classes.  
 Source: Author's calculations based on FSB Annual Reports.



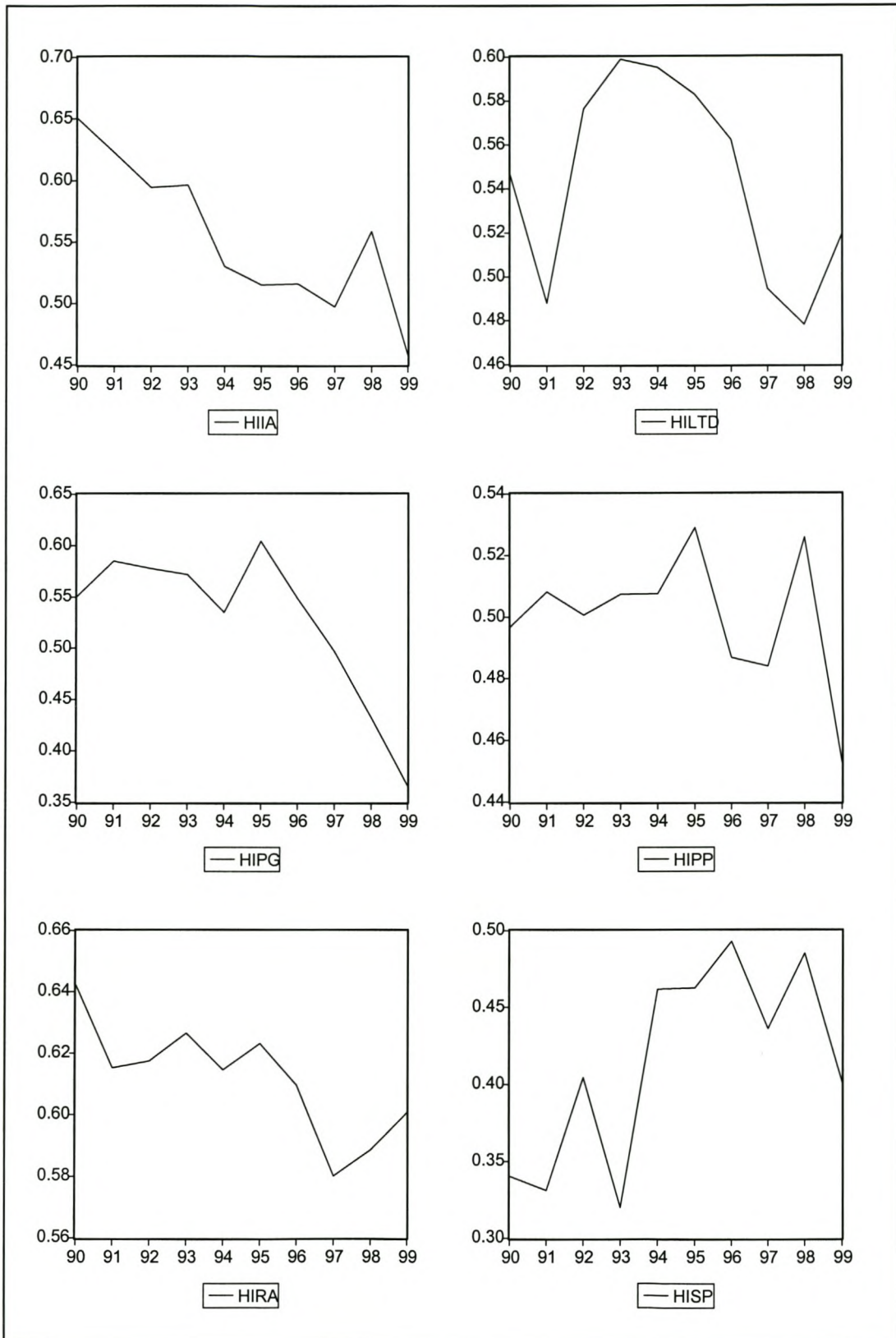


Figure 23: Hovarth Index for the different income groups.  
 Source: Author's calculations based on FSB Annual Reports.

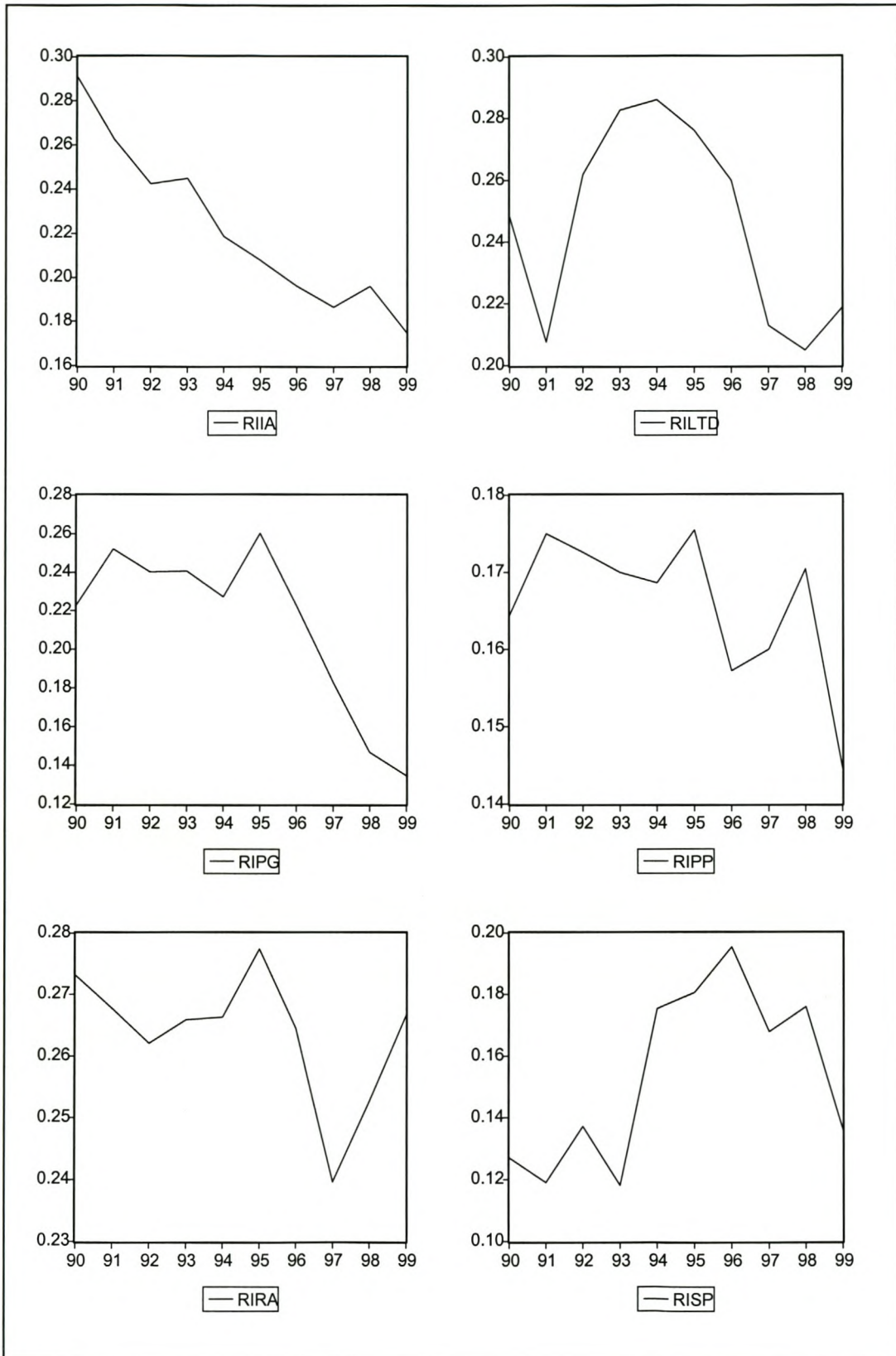


Figure 24: Rosenbluth Index for the different income groups.  
 Source: Author's calculations based on FSB Annual Reports

Figure 25 depicts the concentration measures calculated with the broader definition in mind. The total gross written premium income of all registered firms in the FSB Annual Reports were taken into account and no separate calculations were performed for individual income/product classes. All of the concentration graphs indicate a decrease in concentration levels from about 1995.

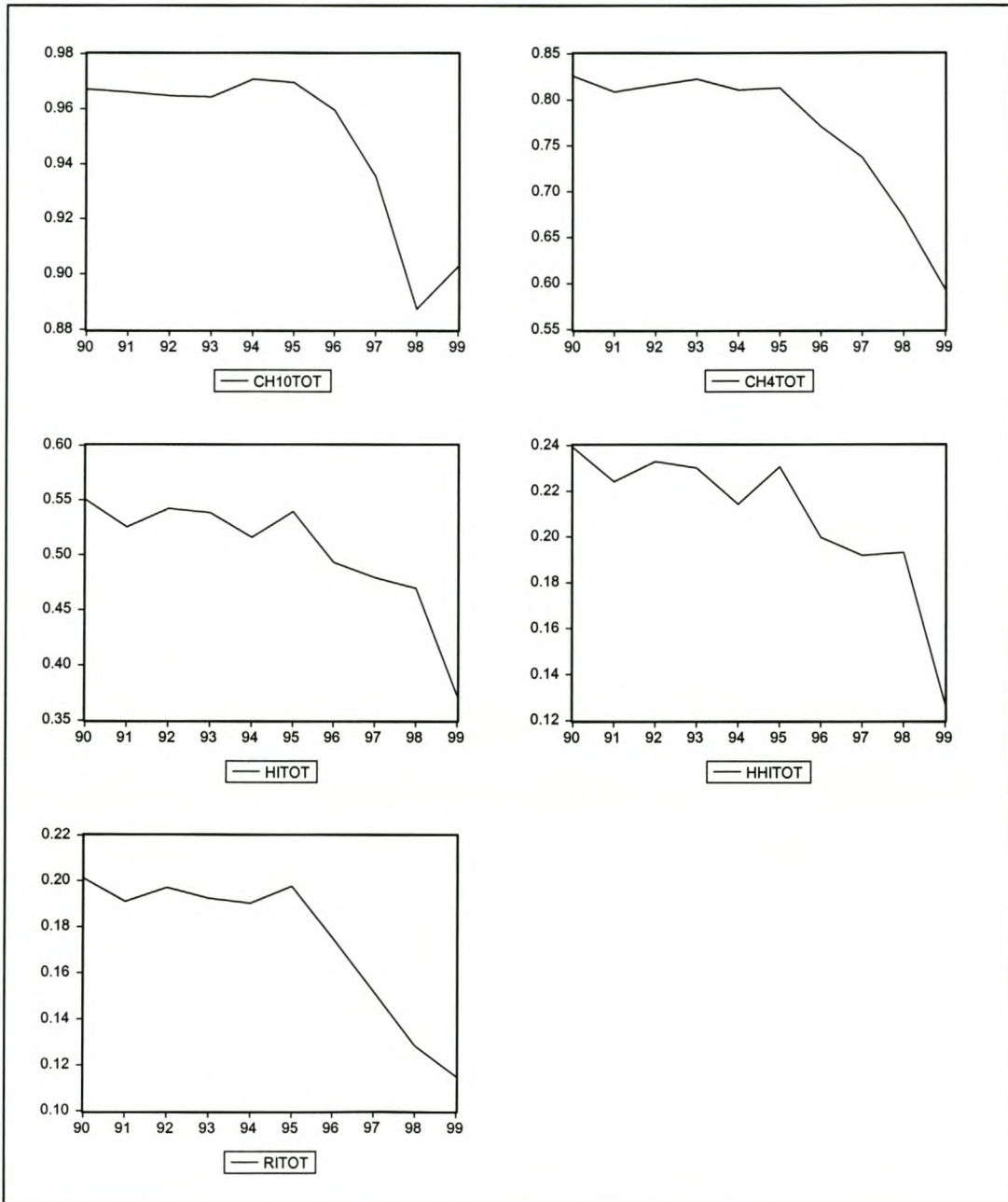


Figure 25: Concentration measures for total gross written premium income of the long-term insurance industry.

Source: Author's calculations based on FSB Annual Reports.

The ten-firm concentration ratio, however, shows an increase in concentration from 1998 to 1999, which again reaffirms the high level of concentration consolidated in the top ten firms in the South African long-term insurance industry. The fact that the four-firm concentration ratio shows a substantial decrease up to 1999 indicates a more equal spread of market power in the top four firms.

As far as concentration is concerned, the tendency is towards high levels of concentration and market power consolidated in the top ten firms. Market power within the top ten has been distributed more equally. The declining summary measures support the notion that the smaller firms in the industry target niche markets, and one could therefore assume that the firms not in the top ten are splitting the already “thin market share leftovers” even further. This assumption is only partially correct.

*Table 21: Indication of the increase or decrease in average market share as percentage of total market share of both the top ten and rest of firms in the long-term insurance industry of South Africa.*

Year	Top Ten	Rest	Total	Avg MS%	%Year to Year	Avg MS%	%Year to Year
1990	20 361 423	692 981	21 054 404	0.1496		9.6709	
1991	20 540 473	722 617	21 263 090	0.1478	-1.2361	9.6602	-0.1107
1992	28 838 563	1 056 142	29 894 705	0.1413	-4.3612	9.6467	-0.1391
1993	35 358 356	1 309 664	36 668 020	0.1488	5.3109	9.6428	-0.0402
1994	42 816 050	1 286 799	44 102 849	0.1216	-18.3095	9.7082	0.6782
1995	57 160 571	1 794 620	58 955 191	0.1050	-13.6585	9.6956	-0.1301
1996	62 123 975	2 625 274	64 749 249	0.1308	24.6022	9.5945	-1.0422
1997	77 147 748	5 326 698	82 474 446	0.1538	17.5740	9.3541	-2.5057
1998	101 614 164	12 903 195	114 517 359	0.2620	70.3994	8.8733	-5.1409
1999	104 313 894	11 225 230	115 539 124	0.2112	-19.3971	9.0284	1.7490
Percentage growth in average market share as % of total				41.2%	6.77%	-6.6%	-0.7%

*Source: Author's calculations based on FSB Annual Reports*

The smaller firms did indeed turn their attention to certain niche markets, but to assume that new entrants into the market leads to diminished overall market shares for the firms outside of the top ten is wrong. This assumption does not take account of the fact that the market is growing as well and that the new firms often build a clientele that would not have been part of the original market. What has happened is that the average gross written premium income (market share) as a percentage of the total gross written premium income of the firms outside of the top ten has increased over the ten-year period by 41% (see Table 21). On the other hand, the average gross

written premium income of the top ten firms as percentage of total gross written premium income has decreased by 6.6% over the specified period (see Table 21).

Table 21 states that there has been growth in the average market share of the smaller firms as a percentage of the total market share, thus that some of the growth in the industry has spilled over to the smaller firms. The base from which this growth has been calculated for the firms outside the top ten is so small, however, compared to the market share of the top ten that the reader must be wary of not reading too much into a 41,2% increase. It indicates that there has been an increase in the market share but more importantly on average a year-to-year growth of only 6.7% over the ten years and on average a year-to-year negative growth of 0.7% for the top ten over the ten years has been realised. Thus even though the market has expanded, the relationship regarding the spread of market shares between the top ten and the smaller firms remained fairly constant.

The downward trend since 1995 of the concentration levels in the long-term insurance market (see Figure 26) can be attributed to changes in the market shares of the top ten firms and not to an overall equalisation of market shares.

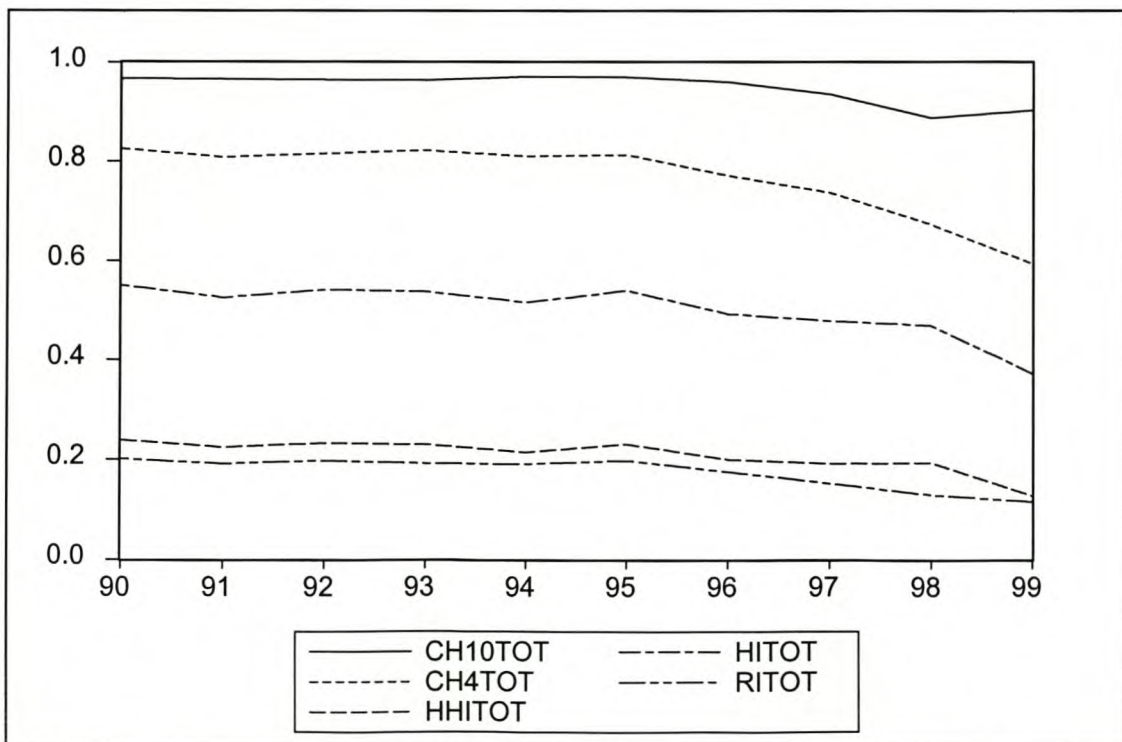


Figure 26: Concentration measures for the total long-term insurance market.  
Source: Author's calculation based on FSB Annual Reports.

In summary, concentration levels in the South African long-term insurance industry is very high. This can be attributed to the concentration of market shares in the top ten firms. Even though a downward trend is visible, it is mainly due to changes within the top ten firms' market shares. Attention has been given to two definitions of the relevant product market. Separating the total market into different product classes provides an argument for in-depth market analysis, before competition authorities can prohibit a hypothetical merger. Sufficient supply-side substitution does exist, therefore analysis of the total market is also acceptable. Regarding further analysis of the long-term insurance market and the study of the SCP paradigm, the total market definition will be used.

### **3.2.3 Entry Analysis**

Part of determining the industry structure and its competitive nature has to do with ease of entry. According to US merger Guidelines (1992:20-21), entry conditions can be described as follows: "A merger is not likely to create or enhance market power or to facilitate its exercise, if entry into the market is so easy that market participants, after the merger, either collectively or unilaterally could profitably maintain a price increase above pre-merger levels... Entry is that easy if entry would be timely, likely, and sufficient in its magnitude, character and scope to deter or counteract the competitive effects of concern. In markets where entry is that easy (i.e., where entry passes these tests of timeliness, likelihood and sufficiency), the merger raises no antitrust concern and ordinarily requires no further analysis".

As stated in the theoretical discussion on barriers to entry, firms can act as price makers and be earning above-average profits in the long run due to sufficient barriers to entry. It was mentioned in the section under market definition that the numbers of registered long-term insurers increased. It would therefore appear that new entrants can enter the market with relative ease. However, due to stringent regulation by the Financial Services Board certain rules must be adhered to.

Aspiring insurers must apply for registration to the Registrar in order to register for a combination of, or all, the business classes identified. Registration for new product

classes will be evaluated according to stringent guidelines as set out in section 10 of the Long-term Insurance Act No. 52 of 1998 (RSA 1998:22). If the Registrar grants the application, the party concerned will be issued a certificate of registration authorising the party to carry on with the relevant long-term business as specified (RSA 1998:20).

Financial requirements accompanying an application are determined through the utilisation of the financial soundness method of capital adequacy requirements. The minimum value must be equal to or greater than the amount of 10 million rand or 1% of the value of linked liabilities and 5% of the value of liabilities other than linked liabilities of the long-term insurer involved (Insurance Amendment Bill 2000:11). Apart from this financial barrier, the rules and regulations as set out by the Long-term Insurance Act No. 52 of 1998 is the greatest physical barrier to entry.

New firms can therefore enter the market with relative ease. However, as the section on market concentration indicated, it is very difficult to erode the client base of the well-established incumbents and new entrants must therefore focus on smaller specialised niche markets. Examples of such established incumbents are Sanlam, Old Mutual and Liberty, and taking into account that these three companies are household names in South Africa with an extremely large client base and superior capital layout, the difficulties of competing with these giants in all the business classes are apparent.

It would seem then that in the case of defining the market according to the various business classes, hypothetical mergers between niche market players could lead to increased economies of scale and increased efficiency. New entrants can compete with smaller and large incumbents, specialising in specific business classes. Barriers to entry, whether capital costs involved, or the well-established names of the largest long-term insurers, may prove too high for new entrants aiming to compete with the largest incumbents.

### 3.2.4 Forward Causality

Thus far considerable consideration has been given to various aspects of the long-term insurance industries' structure. According to the Structuralist's belief as evidenced in the SCP paradigm, high levels of concentration will lead to uncompetitive conduct to ensure prices above marginal cost and long-run economic profits. This section will test the notion of forward causality and whether it exists within the long-term insurance industry.

Reviewing the SCP paradigm Figure 27 captures the essence of the frame of thought set out in the paradigm. A logical assumption to make from this figure is that the more concentrated a market becomes, the more its monopoly profits will increase. Bain argued that successful collusion between firms would result in joint profit maximisation. The ability to collude would increase with concentration and as a result from this *ceteris paribus* monopoly profit rates could be expected to increase with concentration (Reekie 1984:147).

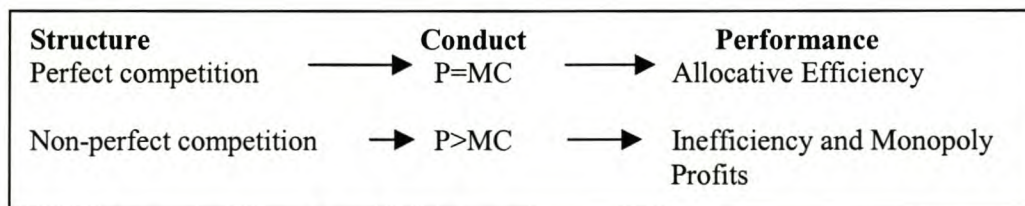


Figure 27: Summary of SCP paradigm

Source: Reekie 1984:146

This “alleged” concentration-profits relationship has led to an active debate regarding its validity and of course what the correct causal relationship is. This debate based on the South African manufacturing sector was introduced in section 3.1. In this section the author will initially test for simple forward causality or conversely a positive relationship between profitability and concentration in the long-term insurance industry of South Africa. Later in the chapter the author will try to find evidence of Demsetz's efficiency arguments.

Data from the FSB Annual Reports for a period of ten years (1990-1999) will be used to determine profitability. The concept of profitability, however, reveals a degree of



complexity. Table 22 indicates the income expenditure break-down for the long-term insurance industry of South Africa. Interpreting a measure for profitability along the same guidelines provided by Reekie (1984) and later by Leach (1992b and 1997) in the same format as the Lerner Index  $((P-MC)/P$ ;  $(\text{sales-costs})/\text{sales}$ ) yields two possibilities in the long-term insurance industry. Total premium income provides a satisfying substitute for sales figures; determining the appropriate costs, however, provides the dual challenge. Costs can either be interpreted to include benefits being paid out or to exclude these benefits from operating costs.

*Table 22: Break-down of the income and expenditure of the long-term insurance industry*

<b>Income:</b>	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Net premiums	21 807	24 523	31 217	38 378	46 079	61 772	68 402	82 474	114 517	115 539
Investment income	10 584	12 029	13 844	15 455	17 727	23 174	25 841	28 994	36 010	31 963
Other income	7 750	7 172	7 167	381	642	2 024	1 768	3 146	2 874	2 049
<b>Total</b>	<b>40 141</b>	<b>43 724</b>	<b>52 228</b>	<b>54 204</b>	<b>64 448</b>	<b>86 970</b>	<b>96 011</b>	<b>114 614</b>	<b>153 401</b>	<b>149 551</b>
<b>Expenditure:</b>										
Benefits	12 215	13 810	20 111	25 850	34 736	44 610	53 776	69 347	92 470	104 787
Management Exp	1 967	2 375	2 951	3 266	3 650	4 489	5 089	5 952	9 504	8 521
Commission	1 792	2 033	2 427	2 948	3 422	4 520	4 790	4 903	5 621	5 358
Other	655	560	684	866	0	76	441	534	830	240
<b>Total</b>	<b>16 629</b>	<b>18 778</b>	<b>26 173</b>	<b>32 930</b>	<b>41 808</b>	<b>53 695</b>	<b>64 096</b>	<b>80 736</b>	<b>108 425</b>	<b>118 906</b>
<b>Net</b>	<b>23 512</b>	<b>24 946</b>	<b>26 055</b>	<b>21 274</b>	<b>22 640</b>	<b>33 275</b>	<b>31 915</b>	<b>33 878</b>	<b>44 976</b>	<b>30 645</b>
Lerner-eqv1	0.2374	0.2343	0.1616	0.1420	0.0927	0.1308	0.0630	0.0211	0.0532	-0.0291
Lerner-eqv2	0.7976	0.7974	0.8058	0.8155	0.8465	0.8529	0.8491	0.8619	0.8607	0.8778

*Source: Author's calculations based on FSB Annual Reports*

Table 22 shows Lerner-eqv1 and Lerner-eqv2, which constitute the measures for profitability based on the two alternatives mentioned above. Lerner-eqv1 was calculated with all the costs being subtracted<sup>20</sup> and in the case of Lerner-eqv2 the benefits paid out were omitted from the calculation. Both these equivalents serve as a crude measure for profitability.

Expanding on the Lerner index Pindyck and Rubinsfeld (2001:410) defined it as follows:

$$L = (P - MC)/P = -1/E_d$$

<sup>20</sup> According to  $(TR-TC/TR)$  formula explained on page 113.

Taking the concentrated nature of the long-term insurance industry into consideration, expectations of a low price elasticity of demand might be in order<sup>21</sup>. Lerner-eqv1, however, yields the opposite and displays higher levels of demand elasticity. There are two reasons why the author did not use this argument to eliminate Lerner-eqv1 as an indication of monopoly power. First, the Lerner-eqv1 is only a crude measure of profitability and there is not strong evidence to say that the same definition would apply as in the case of the pure Lerner Index. Second, due to the competitive nature of the firms and the fact that the products are fairly homogenous, expectations of high degrees of autonomy regarding price setting are not realistic. Therefore refuting Lerner-eqv1 on the basis of inelastic demand is not sufficient.

The Lerner equivalents as calculated by the author are illustrated in Figure 28. Lerner-eqv1 discussed above seems to yield the expected trend, in accordance with the assumption made by the Structuralists<sup>22</sup>. Lerner-eqv2, irrespective of the assumption of the SCP paradigm, provides for a negative concentration-profits relationship.

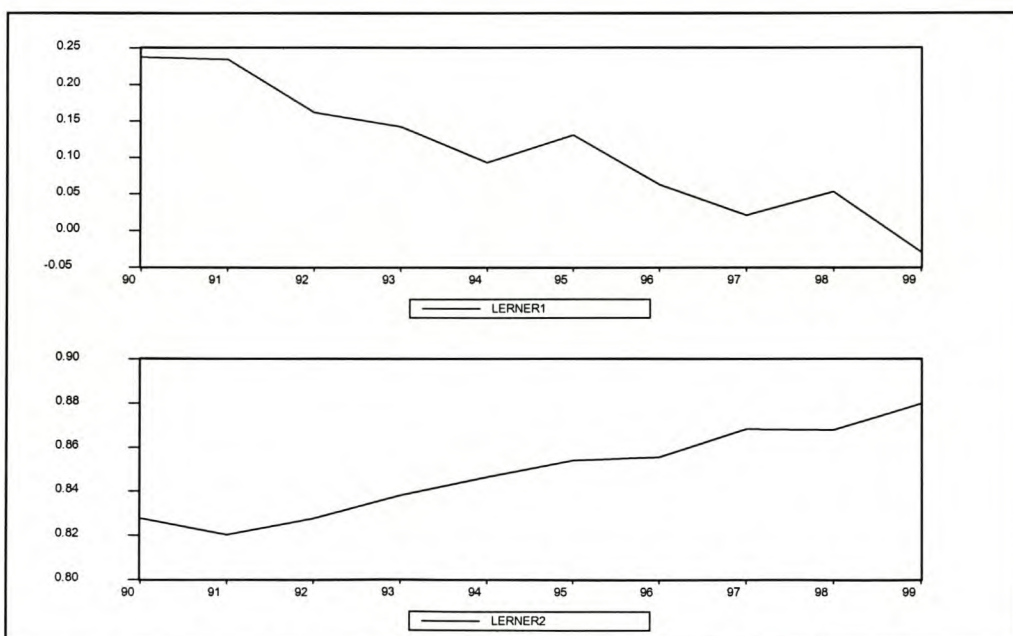


Figure 28: Graphical representations of the Lerner-equivalents 1 and 2.  
Source: Author's calculations based on FSB Annual Reports.

<sup>21</sup> A highly concentrated market, i.e. monopoly, has more freedom to alter prices due to inelastic demand. Low elasticity of demand would equate to a higher Lerner-eqv, i.e. Lerner-eqv2.

<sup>22</sup> Taking into account that a downward trend in concentration levels was indicated when market concentration was discussed.

The results from OLS regressions between the concentration measures determined in a previous section and the Lerner equivalents (crude measures for profitability) are provided in Table 23.

*Table 23: Correlation matrix of concentration and industry profitability for the long-term insurance industry: 1990-1999*

Independent Variable	Dependant Variable	
	Lerner-eqv1	Lerner-eqv2
CR10	1.994* (2.695)	-0.635* (2.410)
CR4	0.899*** (3.791)	-0.284** (3.198)
Hovart Index	1.358*** (4.257)	-0.419** (3.310)
Rosenbluth Index	2.308*** (4.106)	-0.723** (3.326)
Herfindahl-Hirschmann	2.223*** (4.532)	-0.686*** (3.426)

*Source: Author's calculations based on FSB Annual Reports*

*Notes: Numbers in parenthesis are the absolute values of the t-statistics.*

*\*Statistically significant at the 5% level (two-tailed test).*

*\*\*Statistically significant at the 2% level (two-tailed test).*

*\*\*\*Statistically significant at the 1% level (two-tailed test).*

It is apparent from Table 23 that there is a statistically significant positive correlation between Lerner-eqv1 and the measures of concentration. This fits perfectly with the argument of the Structuralists and according to them provides sufficient evidence of forward causality. Table 23, however, also indicates the opposite, a negative concentration-profits relationship (Lerner-eqv2). This contrasting evidence is based on a singular difference in interpretation of the elements that should be included in the crude measure for costs.

The problem of calculating a suitable measure for profitability is not something new. Accounting data reveal numerous flaws and exclude information needed for economic evaluation, i.e. the differences between economic profits and accounting profits. In short, economic profits are revenues minus the opportunity cost of inputs. There are good data available for the calculation of revenues; however, calculating the annual costs of long-lived assets such as plants, equipment, etc. reveals the pitfalls in using accounting data. Accounting data provide the book value, calculated using the historical value of an asset and not the replacement value of that particular asset (Waldman 1997:436). These flaws in the accounting data led to opposing beliefs

amongst economists: those who believe they are not useful at all and those who believe they could be used with caution (Waldman 1997:440).

With the cautionary approach of the latter group, a subtle redefining of the crude measure for profitability will be implemented. In actual fact profitability will be defined as excess return on sales. Assuming that the firms in the long-term insurance industry are in long-run equilibrium and are operating with constant returns to scale, the profit rate on sales on average across all products produced will be equal to the Lerner Index  $((P-MC)/P)$  (Waldman 1997:434). If returns to scale are constant then  $MC=AC$  thus:

$$(P-MC)/P = (P-AC)/P = q/q * (P-(TC/q))/P = TR-TC/TR$$

which provides for economic profits over sales (Waldman 1997:434).

Using this redefined measure for profitability yields the same results as Lerner-eqv1. This also correlates with the measure of profitability used by Adams and Hardwick (1999:4), namely reported annual surplus to total premium income. It therefore seems as if Lerner-eqv1 provides adequate representation of profitability in the long-term insurance industry and, more importantly, data supporting the forward causality arguments of the Structuralists.

The purpose, however, is not merely to accept the SCP paradigm forward causality argument, but to challenge it. The articles of Reekie and Leach, as explained in section 3.1.1 based on the manufacturing sector, provide ample support for a possible counter-argument. The author will likewise limit the challenge to Demsetz's efficiency hypothesis.

### 3.2.5 Reverse Causality

The concept of reverse causality under the auspices of Demsetz's efficiency hypothesis and its possibilities in the manufacturing sector have been discussed at fair length in section 3.1. Through a series of articles the possibility of the efficiency hypothesis were tested, with the last attempt noted referring to the utilisation of the Chapelle Cottle extension. The Chapelle Cottle extension might not work in the long-term insurance analysis; however, it provides definite insight to the existence of reverse causality as far as the manufacturing sector is concerned.

An attempt will be made to find proof for the existence of the efficiency argument. Data on the long-term insurance industry from the Financial Services Board Annual Reports 1990-1999 will be used. Various differences between the data, however, make such an exercise rather challenging. Leach and the other authors that employed manufacturing data isolated one or two years and then worked with the data from many firms in different industries in the manufacturing sector. The study of the long-term insurance industry is focussed on one industry over a ten-year period. The differences will demand an approach based on the same principles as the other studies, but applying differing dynamics to the analysis.

Before any further analysis is possible the opposing viewpoints must be highlighted. Bain, who laid the foundation of the SCP with his 1951 article, argued that successful collusion between firms would result in joint profit maximisation (Reekie 1984:147). It would therefore be reasonable to expect, according to the Structuralists' view, that small firms should be earning equally high rates of return in concentrated markets as those earned by the larger firms.

Demsetz's 1973 article provides evidence for his notion that through superior efficiency large firms earn higher rates of return. His hypothesis could yield the following interpretation: only for large firms should there be a positive relationship between concentration and profitability. Leach used this argument in his 1992b article; however, due to the absence of so many different industry observations, the author must keep to the principles of the Reekie analysis of 1984. The underlying assumption that would turn the conventional SCP view on its head was that larger

firms in concentrated industries will make above-average profits and smaller firms in these industries will not (Reekie 1984:153).

The dynamics of the author's analysis will differ from Reekie's in the sense that concentrated industries<sup>23</sup> will change to the top ten firms in the long-term insurance industry as the CR10<sup>24</sup> remained extremely high during the ten year period. Profit rates of small firms in the CR10 group will then be compared with the profit rates of the large firms in the CR10 group. To distinguish between the sizes of firms the author employs asset size of the firms in line with the study done by Hardwick and Adams (1999:5).

If there is proof of Demsetz's efficiency hypothesis, it is expected that the large firms will have above-average profit rates and the small firms will have below-average profit rates. To test this the author had to divide the firms in the CR10 group for each year (1990-1999) into small and large firms. Size was classified according to average total asset size for all the long-term insurance firms in a specific year. If the firms' individual asset size is larger than average, it is determined as large and conversely if the firms' asset size is below average it is labelled as a small firm.

Profit rate is determined according to:

$$(TR - TC)/TR$$

and is used to calculate the average profit rate for the firms in the CR10 group for each year (1990-1999). Total revenue refers to total written premium income; total investment income is not included. Total costs refer to:

- Commission;
- Expenses of management;
- Taxation paid;
- Other expenditure; and
- Benefits paid out (FSB Annual Reports)<sup>25</sup>.

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<sup>23</sup> Concentrated industries as used by Reekie to refer to the industries in the manufacturing sector.

<sup>24</sup> Ten-firm concentration ratio was discussed in section 3.2.2 under market shares and concentration.

<sup>25</sup> In accordance with the calculation of Lerner-eqv1.

The method explained above yields the results as illustrated in Table 24<sup>26</sup>. For all of the ten-year intervals except 1990 the majority of small firms yielded a profit rate above the average profit rate. In conjunction with Table 25, which shows the percentages of small and large firms out of the total of small and large firms that achieved a profit rate above the average, it is apparent that over the ten-year period not only were the majority of small firms above-average achievers, but the number of small firms yielding above-average profit rates remained fairly constant.

*Table 24: The number of small and large firms divided according to profit rate.*

Year	SF>avg PR	SF<avg PR	LF>avg PR	LF<avg PR
1990	2	3	2	3
1991	3	1	2	4
1992	3	1	3	3
1993	3	1	3	3
1994	2	2	3	3
1995	2	2	3	3
1996	3	1	2	4
1997	2	0	4	4
1998	3	0	2	5
1999	3	0	3	4

*Source: Author's calculation based on FSB Annual Reports*

*Table 25: Percentage of small and large firms out of total small and large firms achieving above-average profits*

Year	S F > a v g P R	L F > a v g P R
1 9 9 0	4 0 %	4 0 %
1 9 9 1	7 5 %	3 3 %
1 9 9 2	7 5 %	5 0 %
1 9 9 3	7 5 %	5 0 %
1 9 9 4	5 0 %	5 0 %
1 9 9 5	5 0 %	5 0 %
1 9 9 6	7 5 %	3 3 %
1 9 9 7	1 0 0 %	5 0 %
1 9 9 8	1 0 0 %	2 9 %
1 9 9 9	1 0 0 %	4 3 %

*Source: Author's calculations based on FSB Annual Reports*

<sup>26</sup> The abbreviations used in Table 3.2.11 are:

- SF>avg PR = Small firms with a profit rate larger than the average profit rate for the firms in the top ten.
- LF>avg PR = Large firms with a profit rate larger than the average profit rate for the top ten firms.
- SF<avg PR = Small firms with a profit rate lower than the average profit rate for the top ten firms.
- LF<avg PR = Large firms with a profit rate lower than the average profit rate for the top ten firms.

Table 24 provides no reason to argue in favour of Demsetz's efficiency hypothesis as it appears that a fair amount of ambiguity exists with regards to small and large firms achieving above-average profits. Each year there are above- and below-average achievers in both size classes and therefore the following reverse causality argument cannot be justified: performance leads to structure, therefore larger firms in concentrated industries will make above-average profits and small firms will not.

However, Table 24 could be biased against the larger firms. The reason for this is twofold, namely the nature of long-term insurance business as well as the way in which the author calculates the profit rate. Well-established (larger) long-term insurance firms are in the position to pay substantial benefits. The younger (smaller) firms may achieve a large written premium income, but do not necessarily pay substantial amounts in benefits due to the long-term nature of the long-term insurance industry.

To establish a more equal cost base the author constructed a multiplier that would ensure a higher degree of equity in the calculation of profit rates. The multiplier is:

$$M = 1 - (IBP/TSB),$$

with IBP referring to individual benefits paid out and TSB referring to the total sum of benefits paid out by the top ten firms. The multiplier benefits all the firms; however, it is more beneficial to firms paying large amounts of benefits as a percentage of the total benefits paid out.

The multiplier is used in the following way:

$$TR - TC(M)/TR,$$

thus decreasing total costs, depending on the amount of benefits paid out as percentage of total benefits paid out by the top ten firms. Table 26 indicates the new predicament after the application of the multiplier. There is no clear indication of large firms earning constantly above-average profits and small firms earning constantly below-average profits. Table 27 reinforces the above conclusion. Even though the average of the number of small firms that achieved above-average profit rates, over the ten-year period, as a percentage of the top ten firms declined from 26% to 18%, it does not prove beyond doubt that reverse causality is applicable.



Table 26: The number of small and large firms divided according to weighted profit rate

Year	Weighted			
	SF>Avg PR	SF<Avg PR	LF>avg PR	LF<avg PR
1990	1	4	2	3
1991	2	2	1	5
1992	1	3	3	3
1993	2	2	2	4
1994	2	2	4	2
1995	2	2	4	2
1996	1	3	3	3
1997	2	0	3	5
1998	3	0	2	5
1999	2	1	4	3

Source: Author's calculations based on FSB Annual Reports

Table 27: Percentage of weighted and unweighted small and large firms of the top ten firms

Year	Small		Large	
	% of Total	% of Total (M)	% of Total	% of Total (M)
1990	20%	10%	20%	20%
1991	30%	20%	20%	10%
1992	30%	10%	30%	30%
1993	30%	20%	30%	20%
1994	20%	20%	30%	40%
1995	20%	20%	30%	40%
1996	30%	10%	20%	30%
1997	20%	20%	40%	30%
1998	30%	30%	20%	20%
1999	30%	20%	30%	40%
Average	26%	18%	27%	28%

Source: Author's calculations based on FSB Annual Reports

According to the author's calculations no conclusive arguments can be made regarding the presence of Demsetz's efficiency hypothesis and its justification for the reverse causality argument. The author regrets that data limitations prevented the application of the Chapelle and Cottle extension of the Demsetz efficiency hypothesis as used by Leach (1997) to test further for reverse causality.

Given the available theoretical background and lack of conclusive evidence to motivate reverse causality, the author submits the following final remarks. As far as evidence for the forward causality argument is available, it would be unwise to ignore the implications of the SCP causal relationship and its justification for the

implementation of deconcentration measures. The long-term insurance industry portrays the same characteristic of high concentration levels as the majority of industries in South Africa. Ignoring the detrimental effects of a concentrated industry, as discussed in Chapter 2, could lead to uncompetitive behaviour and inefficiency.

The financial services sector at large is conducive to the formation of extremely large multi-disciplinary conglomerates and even though this industry is well regulated as far as the specific activities is concerned, the lack of proof for the efficiency argument above emphasises the importance of having authorities that can regulate competition in this sector.

Chapter 3 uses available research on the South African manufacturing sector to determine the likelihood of reverse causality regarding the SCP paradigm. The data limitations present in the study illustrates the need for further research regarding the financial services sector. The author is of the opinion that the chapter on reverse causality is all but closed; however, given the data and the calculations of this work, an inclination towards a Structuralist viewpoint is justified.

The justification of the Structuralists' viewpoint, regarding the long-term insurance industry has important consequences for competition authorities. It would seem that the current stance of the Competition Commission, employing the paradigm as theoretical framework for policy implementation, deserves credit as far as the long-term insurance industry is concerned.

## **CHAPTER 4**

### **CONCLUSION**

Assessing the validity of the Structure, Conduct and Performance paradigm as theoretical framework for the application of competition policy requires a thorough understanding of the regulatory implications as well as of the elements of the paradigm.

The theoretical framework enables an understanding of the importance of regulatory actions to ensure a fair dispensation for society. An understanding of the theoretical aspects, however, does not reveal the true nature of the interrelationship that exists between the various elements noted. Mason and Bain introduced thoughts regarding this interrelationship and subsequently Demsetz reacted with a counter-argument.

This counter-argument claiming that deconcentration measures punish the most efficient firms led to an active debate internationally as well as in South Africa. South African authors, e.g. Reekie and Leach provided strong arguments, raising questions regarding the conventional SCP paradigm and its validity as justification for preventing highly concentrated markets in the manufacturing sector.

The theoretical input gained from the work done by Reekie and Leach was applied to an industry in the tertiary sector of the economy. The lack of research on the services sector provided the rationale for the author's selection, i.e. the long term-insurance industry.

The insurance industry is a main role-player and a large provider of employment in South Africa. The nature of the long-term insurance business and the fact that the industry is highly concentrated, like the manufacturing industry, made it a likely selection for SCP validation.

To establish the validity of the SCP paradigm, it was important to define the elements of the paradigm. Concentration levels were determined according to two market definitions, namely the individual product market or income class and the single

geographical market definitions. Both of the market definitions pointed to high levels of concentration in South Africa compared to the manufacturing sector, as well as the life insurance industry in the United Kingdom.

Defining the market according to the indicated business/income classes yielded that mergers between firms focusing on different niche markets could lead to economies of scale. Preventing such a merger based on the single market definition would not be optimal. The single market definition is, however, also applicable as sufficient supply-side substitution can take place, subject to the approval of the Financial Services Board.

New firms can enter the market, subject to the procedures stipulated by the Financial Services Board. For the indicated period (1990-1999) the smaller firms entering the market had to focus their attention on niche markets and gained a negligible market segment at the cost of the firms forming the ten-firm concentration ratio. New entrants may therefore not face severe physical barriers to entry to compete in a market with fairly homogenous products; however, high capital costs and well-established names may prevent them from actively competing with the top ten incumbents.

The conclusions regarding the concentration-profits debate were determined through the assessment of forward and reverse causality. The positive relationship between the defined Lerner- $eqv1$  and the concentration measures used indicated beyond a doubt that profits and concentration levels are positively correlated. These data support the forward causality argument of the Structuralists.

The reverse argument was tested based on Demsetz's efficiency hypothesis and applied using the theoretical methodologies of Reekie and Leach. No evidence could be found that would support the notion that large firms in a concentrated market will, due to their superior efficiency, earn above-average levels of income in contrast to the smaller firms in the concentrated industry that will earn below-average levels of income. The lack of proof in this regard, however, does not indicate that reverse causality does not exist. Leach indicated with the application of the Chappelle and Cottle extension of the Demsetz efficiency hypothesis in the manufacturing sector that

reverse causality does exist. Data limitations prevents the same exercise in the long-term insurance industry. It would therefore be premature to state beyond a doubt that reverse causality is not relevant regarding the long-term insurance industry.

The support for the Structuralists' viewpoint supporting forward causality is also not absolutely convincing as correlation does not necessarily imply causality. Therefore, with the available data and calculations, an inclination towards the forward causality argument is possible. This inclination, however, can not be founded solely on the basis of proof in favour of the Structuralists, but also on the lack of evidence available to prove reverse causality.

At present, then, the SCP paradigm provides the most acceptable theoretical framework for competition policy implementation as far as the long-term insurance industry is concerned.

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