THE ANALYSIS OF MARKET POWER AND/OR EFFICIENCY IN THE ETHIOPIAN FOOD AND BEVERAGES MANUFACTURING INDUSTRIES: A FIRM LEVEL ANALYSIS

A Thesis presented to the School of Graduate studies Addis Ababa University in Partial Fulfillment of the Requirements for the Degree of Master Art in Economics

By

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This Study Paper should be dedicated to my mother W/ro Etaferahu Kasaye

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Abstract

Using New Empirical Institutional Organization (NEIO) framework, this study examine the market behavior of processing firms in the Food and Beverages industries in Ethiopia. To this end we tests the hypothesis of price taking behavior of 13 Ethiopian Food and Beverages manufacturing industries for the period 1996/97 to 2004/05. The estimated conjectural variation elasticities and Lerener indices indicated that the sector was anti-competitive in the period under analysis.

In our research thesis we make three contributions to the existing literature. First, we estimate and test for the degree of oligopoly power and /or the cost efficiency effects in the Ethiopian Food and Beverages industries at the four-digit SIC level with annual data. Second we measure the elasticities of scale and test the CRS hypothesis separately for each industry. Finally we provide estimates of the price-elasticity of demand at the industry level. Thus empirical analysis provides cardinal and ordinal measures of oligopoly power as well as elasticities of scale and demand across the Ethiopian Food and Beverages industries.

The result of such a study should be of special interest to legislators seeking a competitive environment, where such policy instruments such as trade licensing investment incentives, import quotas and tariffs could all be manipulated to bring about a greater degree of competition, if the existing degrees of monopoly were shown to lead to excess profit margins.

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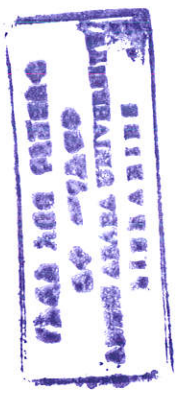


CHAPTER ONE

Introduction

1.1 Background

The main purpose of this study is to measure the degree of market power and/or cost efficiency in the Ethiopia's food and Beverages industries, and to examine the implications of the market power and the role of competition. An attempt is also made to establish trade- off between market power and efficiency in the industries.

In the first part of the study, we shall try to examine the statement of the research problem, objectives and significance of the study, and the scope or limitation of the study.

The second part deals with a brief historical background of the Ethiopian Food and Beverages Manufacturing industries. The third part is devoted to the summary of relevant literature review. The fourth part will deal with the methodology employed and discuss the various kinds of measurement of the degree of market power of Food and Beverages industries in Ethiopia and discussion of the implications. The type and source of data used and the hypothesis are also treated under this part.

In the fifth part, an attempt will be made to establish a correlation between market power and/ or efficiency and discussion of the empirical results obtained.

Finally, we make conclusions and recommendations in the sixth part.

1.2. Statements of the problem

Ethiopian manufacturing is particularly dominated by food production. In 2002/03, Food and Beverages accounts for 47% of manufacturing value added, and 30% of the employment.

Agricultural resources that are the basis for Food and Beverages manufacturing are available in fairly large quantities in Ethiopia, which is the main reason for the historical dominance, and the comparative advantages, of the sub sector. Competition from abroad is relatively weaker due to the nature of Food and Beverages manufacturing itself. Food and beverages are very low value goods relative to their weight, which makes the transportation cost significant.

Moreover, since food items are produced for human consumption packaging and transportation requires extra costs related to safe preservation. These are natural barriers to become competitive in producing for local markets.

The status of the domestic market competition, especially in the Food and Beverages manufacturing industries, may be significant factor for the

existing inflationary pressure in Ethiopia. For the last five years, contemporary Ethiopia has gathered momentum by recording a steady economic growth. Along with this growth, however, the country has seen an accelerated, double-digit increase in the price of goods and services. Inflation, which was on average at single digits in 2003/04 and 2004/05, accelerated by the end of 2006/07 and averaged at 17.8%. Food inflation, which is the main driving force, was 11.8% and 7.7% in 2003/04 and 2004/05 respectively, and picked up to 18.8% by the end of 2006/07. What used to cost only one birr a year ago now costs about one and 18 cents (APR 2007/08). The increase in price Index (the main gauge of inflation) has become very detrimental to low-income groups and retirees who live off a fixed income. It is true that Ethiopia at this juncture is faced with an overheated economy with the global soaring price of oil, wheat, corn, and minerals, which may not be regarded as the only conditions to Ethiopia. As indicated above the status of the domestic market competition may also be significant factor for the existing inflationary pressure.

From the existing evident picture of degree on concentration of Ethiopian Food and Beverages industries, where a few firms have a large market share, a monopolistic behavior is emerging. Performance of such firms might lead to welfare losses through inefficient utilization of resources.

For a given production costs a monopolist (more generally, a firm enjoying large market power) charges too high a price, leading to a welfare loss called allocative inefficiency. However, there might be an additional welfare loss, called productive inefficiency, if a firm operating under monopoly has a higher cost than if it were operating in more competitive environments. However, firms lack market power only in the abstract and unrealistic world of perfect competition or in the Bertrand model with homogenous goods and perfectly symmetric firms.

In real-world industries, where there exist fixed costs and products are unlikely to be perceived as perfect substitutions by all consumers, we should expect every firm to have some degree of market power. This problem calls us for the issues of which threshold of market power should be taken in to consideration that a firm has enough market power to reduce the welfare of the society and call for the attention of anti-thrust authorities aiming at identifying the presence of market power, and then regulate or eliminate any monopoly abuse.

1.3. Significant of the study

Currently, the government of Ethiopia has been establishing an authority known as the "Ethiopian Commodity Exchange Authority", which is conducive for the promotion of competitive environment to improve the

economic efficiency and social welfare. The study will be very significant in providing information for the agency and other competition authorities, about the basic problems encountered in implementing the competition policy and solutions to identified problems. Moreover, as the concept of market power and/ or efficiency in Ethiopia is new, it will help the writer to the better understanding of the role of competition in maximizing social welfare and it will also be an additional reference to the future endeavors in the field.

1.4. Scope and Coverage

Large and Medium Scale Food and Beverages Manufacturing survey is confined to those establishments which engaged ten persons and above and use power-driven machinery and covers both public and private industries in all Regions of the country, where establishments under the scope of the survey are found.

1.5 Objectives of the study

1.5.1 General Objective

The overall objective of the study is to investigate the existence of market power and/or efficiency in the food and beverages industries in Ethiopia

and interpret the role of competition in stimulating firms to improve their efficiency so as to maximize the social welfare.

1.5.2 Specific Objectives

1. To estimate the extent of market power in the large and medium Food processing and Beverages industries in Ethiopia;

2. To explore the theoretical relationship between firm's market share and their efficiency;

3. To forward practical recommendations to the target industry for potential legal action.

Therefore, the objectives of the study will come up with possible solutions to the following basic research questions:

- What are the efficiency implications of increasing concentration?

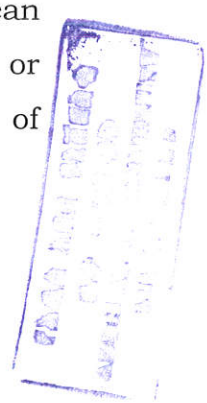
- Is increasing concentration primarily efficiency driven, or does market power breed inefficiencies and wasteful competition?

- Are consumers and/or producers harmed by the increasing concentration?

- How effectives are the regulations in curtailing Food and Beverages processing sector market power when it exists?

1.6. Limitation

As with any other statistical data collection, it is likely that the problems of collection and recording occur in these data. By data collection we mean that items produced may, for example, be underestimated or overestimated which can lead to wrong calculated gross value of production.



CHAPTER TWO

A Brief History of the Ethiopia Food and Beverages Manufacturing Industrial Sector

The institutional framework under the industrial sector operated prior to 1974 was a free enterprise system with an open policy in the sense that no minimum requirement was imposed on the establishment and operation of

enterprises (Befekadu Degefe 1986,P 1). The role of the government was mainly to encourage potential investors both from within and outside the country to commit resources in industrial investments. Accordingly, various comprehensive industrial strategies and policies were issued in the form of proclamations and directives. The overall direction of these economic policies and strategies was to develop the industrial sector so that it fits into the international capitalist economic system (Bulti Terfessa, 1992).

After the collapse of the Imperial regime, post 1974, Derg nationalized enterprises involved in major economic activities and the private sector was allowed only to participate in small-scale industries (Admit Zerihun and Genet Alemu, 2005). In September 1984, the regime issued a comprehensive and long-term development plan, which came to be known as the Ten-Year Perspective plan, covering the period from 1985 to 1994. The development strategy was the state-led import substitution industrialization.

The current government is pursuing Agricultural Development Led Industrialization (ADLI). It is believed that priority to agriculture in the short and medium term will create a big domestic market for industry and supply food and raw materials to industry and this is anticipated to strengthen the inter-sectoral linkage between agriculture and industry will

lead the economy to the development of industry. One of the strategies of the government to accelerate economic development and to improve the living standards of the people is the Industrial Development Strategy (IDS).

The strategy is prepared based on ADLI and is being implemented since 2001/02. The underlying objective of the strategy is to increase the benefits earned from economic integration with an ultimate goal of becoming an industrialized country. This involves strengthening of inter-sectoral linkages (between agriculture and industry) on the domestic front and through exploiting the potential and opportunities of regional and global economic integration. The rural- centered ADLI within the framework of a free economy is the principal driving force of the strategy (PASDEP 2006). In support of this view theory suggest that the response of industry to agriculture will be greater when the share of agriculture in GDP is higher: where the output of industry is less tradable and hence more responsive to domestic demand (John 1994, p 16). In this regard Baran (1973) stated that "... there can be no industrialization without an increase of agricultural output and surplus. There can be no modernization of agriculture without industrialization."

Ethiopian industries are highly dependant on agriculture and demand an adequate supply of agricultural raw materials. However, because of poor agricultural performance, the prospect for rapid industrialization is not

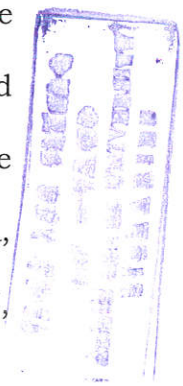
bright. In this context, emphasis should be given to the sectoral integration between agriculture and industry (UNIDO 1986, Vol. 19 P .3).

The integration and interdependence between the industrial and agricultural sectors play a key role to accelerate the country's economic development and to bring about socio-economic transformation. However, the linkage between the two productive sectors has remained very weak; and the industrial base of the economy has continued to be very limited. The annual growth of value added for private medium and large-scale manufacturing industries averaged about 21% while that of the public sector averaged 7%. The share of the private sector in the value added of medium and large-scale manufacturing has increased from 27.4% in 200/03 to 29.9 % in 2003/04 (PASDEP 2006).

Size and distribution of manufacturing reveals the infancy of the sector. The figures in Table 2.1 indicate that, the total number of large and medium Scale Food and Beverages manufacturing establishments for the country as a whole stood at 373 in 1998 E.F.Y. (2005/06). It has shown an increase of only 3 establishments and 0.81 compared to the year before, respectively. For the country as a whole, establishments classified under manufacture of bakery products (ICIS 1541) constituted the largest share accounting for 42.89 percent. Manufacture of dairy (CISI 1520) products and edible oil (CISI 1514) which represents 24 and 8.8 percent of the total, were in second and third position, respectively. That means the

share of the three manufacturing industries was 75.87 percent of the total number of Ethiopian food and Beverages manufacturing industries, which indicates that, the Ethiopian Food and Beverages manufacturing industry is characterized by a high concentration of a limited range of manufacturing activities.

On the other hand, the figures in Table 2.2 reveal that, the distribution of Food and Beverages manufacturing industries by Regional States of the country is highly skewed. Nearly half 51.74 percent of the total Food and Beverages manufacturing industries, which were operating in the reference year, where located in Addis Ababa. Following Addis Ababa, Oromyia, Amhara, SNNP, Tigray and Dire Dawa regions covered 20.37, 9.92, 6.7, 5.9, and 2.95 percent of the total establishments, in that order.



The data shown in summary Tables 2.3 and 2.4 prefers to the total number of percent engaged and number of employees over five years period, i.e., from 1994-1998 E.F.Y (2001/02-2005/06), respectively. In 1997 E.F.Y, there were 32,589 percents in engaged, out of which 31,693 were, employees in the sector. Number of persons in engaged and employees during the survey period, showed an increase of 10.68 and 11.12 percent, compared to that of a year before, respectively. These increases in number of persons engaged and employees could be attribute to the increase in number of establishments covered in 1998 E.F.Y. An

examination of the distribution of person engaged and employees by industries reveals that manufacturing of sugar, bakery, soft drinks, and mineral water industries, as could be expected, accommodated the largest number of employees. These three industries alone, contributed nearly 53.83 percent in both number of person engaged and number of employees through out the period under reviewed.

The percentage of distribution of value added, which indicates the contribution level of, Food and Beverages manufacturing industries, to the total value added in the Food and Beverages manufacturing industries, is given in summary Table 2.5 for the period 1994-1998 E.F.Y. The data in this table make obvious, the fact that, manufacturing of sugar industry's contribution to the total value added, was significantly higher than the other Food and Beverage industries. Other important industries in this respect are: manufacturing of malt, and manufacturing of soft drinks and mineral water. However, it is important to not here, that, despite the small share in the total value added, manufacturing of animal feeds decline in 1998 E.F.Y as compared to that of 1997 E.F.Y. Furthermore, the bakery manufacturing industry, being the second most important in terms of employment creation, its share in Food and Beverage manufacturing value added however, was ranked forth in 1998.

The data in summary table 2.6 refer to the ratio of cost of imported raw materials to that of the total cost of raw materials consumed by industries for the period 1994-1998 E.F.Y. In general, the industries which had the highest rates in the previous year continued to do so in the survey year as well. The high ratios of imported raw materials to the total cost of raw materials consumed, for manufacturing of malt, wine, and soft drinks and mineral water, are indication of the dependency of the industries on imported raw materials. This is a reflection of weak linkages within the manufacturing sector and with agriculture.

The ratio in summary Table 2.7 depicts the share of value added in gross value of production by industries. The share of the industries like, manufacturing of edible oil, dairy products, flour, animal feeds, bakery products, sugar, other non-food products, wine and malt, recorded an increase while the ratio of the remaining four industries (manufacturing of vegetables, meat and fruit, pasta and macaroni, sprites, and soft drinks and mineral water) decline in 1998 E.F.Y, as compared to a year before.

CHAPTER THREE

Literature Review

In the academic literature, a number of studies have been made that have attempted to measure domestic market power and/ or efficiency in manufacturing industries. Markets examined have included Food and Tobacco, Roasted Coffee, Fruits and Rice, Pork, Beer and Cigarettes among others. As Mc Corris et. al., (1995) suggest these studies have been more frequent in North America and infrequent in Europ. Some recent examples have included studies by Azzam and Pagoulators (1990), Bhuyan and Lopez (1997), Martin Stephen (1988), Iwata (1974), Appelbaum (1982), and Quagrainie et al, (2003). However, literature on market power in many developing countries especially in Sub Saharan Africa is scarce and hard to come by.

The assessment of the existence of market power and/ or efficiency in the Ethiopia's Food and Beverages industries has received little attention despite the critical role- played by the sector.

The comparisons of Food and Beverages sub sector with total manufacturing indicate that Ethiopia has a better advantage in the production of Food and Beverages. In particular lower import intensity and energy cost, higher share of value added in total value of production and higher operating surplus clearly show the comparative advantages of the Food and Beverages sector relative total manufacturing.

Considerable empirical investigation has occurred in recent year as to possible market power abuses in Food and Beverages processing industries. Sexton and Lavoie (2000) provide a summary of this work. The study conducted to date has indicated that in highly concentrated industries, a positive (negative) correlation between concentration and selling (purchasing) price exists. This correlation has been found rather consistently across many structure-conduct-performance studies of Food and Beverages processor oligopoly power.

Studies of food processor behavior undertaken in the tradition of the New Empirical Industrial Organization (NEIO) have generally reported some statistical evidences of market power, although the measured departures from competition have often been small. Because these studies have naturally been conducted in industries where structural conditions suggest the possible presence of market power, these results on the whole suggest that market power, in the past, has not been a very important factor in food and beverages processing.

Market power can manifest it self in a number of dimensions, such as high price, reduce out put, reduce choice and quality or diminished technological innovation. The former dimensions-price and out put-are normally the focus for analysis of the static welfare impact of a given

merger, agreement, or conduct. The latter dimensions-choice, quality and innovation- are of particular importance when it comes to assessing the dynamic welfare.

While the dynamic perspective of market power is arguably of great importance, antitrust analysis typically start by considering whether a company has (or will obtain) static market power. After all, with out market power in a static sense, it is unlikely that a company has market power in the dynamic sense.

When market power exists, how does it translate in to measures of social loss and loss to consumers? Measuring static welfare loss from market power is not difficult conceptually. Given the volume of output in an industry, one need to obtain an estimate of mark up of price over cost and an estimate of the elasticity of demand in the market in order to compute the deadweight loss or "Harberger" triangle. An immediate issue is whether to also include the profit rectangle transferred to the monopolists (the so-called Posner (1975) rectangle). The arguments in support of including the rectangle are that monopoly power encourages resource waste or x-inefficiency and wasteful expenditure such as advertising and lobbing to achieve and maintain monopoly position, and that these cost can be approximated by the profit rectangle.

The traditional agreement against monopoly is that it restricts out put below competitive levels implying a misallocation of resources in the economy. The problem arises from price being greater than marginal cost in the presence of market power, precluding a pareto-optimal solution. The key question then is the magnitude of the potential gains to society obtainable in moving to pareto equilibrium, given that distribution of real income is unchanged. Clearly, the answer to this issue is fundamental when formulating anti-trust policies, since the costs of enforcing such law must be weighted against the size of the welfare gains, which result. To provide a solution, theorists have formulated the "welfare" loss concept, which measures the potential gain of movement to perfect competition. The main issues in the debate over the magnitude of welfare loss estimates concern the size of price-cost margins and the elasticity of demand.

It is dubious to argue that the average rate of return in competitive manufacturing industry reflects the global competitive rate of return. In fact, Harberger's data indicates that manufacturing industry was not in long run equilibrium in the period studied, since it was getting a higher rate of return than other sectors. This would cause the price differential due to monopoly, and therefore welfare losses, to be understated.

In 1954, Arnold Harberger proceeded by calculating the deviation of US industry profit rate from the average for all manufacturing. These deviations were then translated in to dollars of 'excess profits' and

expressed as a proportion of sales to give the value of price distortion. The marker price elasticity of demand was assumed to have a value unity, such that dead weight loss is given by half of the price distortion multiplied by the value of sales. The sum of these losses across all sectors gave the welfare loss for the economy as a whole. Harberger's estimate of $ 59 million (0.08 percent of GNP) at first sight appears to downgrade the importance of monopoly as a source of resource misallocation to insignificance. However, this estimate has been the subject of much debate and argument.

Stigler (1956), among others, has attacked Harberger's assumptions that price elasticity is unitary. This would imply that marginal revenue was equal to zero. Since marginal costs are unlikely to be zero in any instance, this clearly is inconsistent with profit maximization. Moreover, it is hard to think of realistic conditions under which the deadweight loss would not be small for it involves the square of the relative price distortion whose average value in the Harberger sample was only 0.036 and which common observation reveals seldom exceeds 0.2 in the long run.

The modern studies include the assumption that not only is monopoly power itself socially undesirable but so too are resources spent on competition to acquire or maintain a dominant monopolistic position. The impact of this assumption on welfare loss measures was huge; for example Cowling and Mueller placed US welfare losses as high as 13.1 percent of

GNP. It would be fair to conclude that the estimates of Harberger and similar studies put welfare losses too small and later developments improved the knowledge of the welfare loss idea and provided a basis for more accurate research.

Empirical studies of consumer welfare loss from Food and Beverages industry market power have focused exclusively on manufactures' power as sellers, including Parker and Connor (1979), Gisser(1982), Bhuyan and Lopez (1995), and Peterson and Connor(1996). Given that no consensus has been reached on the importance of market power in the food system, it is not to find little agreement as to the welfare costs of market power. An important difference among analysts has concerned market power's effect on costs. Some, such as Peterson and Connor (1996) believe market power breeds inefficiency and waste and, thus, justifies inclusion of Posner's rectangle as a welfare loss. Other of a Chicago school persuasion, such as Gisser (1982), believe marker power is mostly efficiency driven and, thus, those benefits must be measured and weighed against the costs of any supra competitive pricing.

The market power versus efficiency argument is most prominently associated with Demsetz (1973, 1974). The efficiency schools argue that if a positive relationship between market concentration and profitability reflects the exercise of market power, it should affect the rate of return of large and small firms in the same way:

> The classic portrayal of the inefficiency produced by concentration through the exercise of monopoly power is that of a group firms cooperating some how to restrict entry and prevent rivalrous price behavior... . However, if firms are able to produce at the same cost, then the rate of return should be independent of the particular site adopted by those firms to achieve low cost production.
>
> (Demstz, 1973, P.4)

Most proponents of the efficiency interpretation of received empirical results subscribe to the Chicago School of industrial economics, a central tenet of which is that the classroom model of perfect competition is sufficient to explain real-world phenomena (Reder, 1982 P.12). If one starts from the position that observed data produced by marker that can be treated as if they are more or less in long-run competitive equilibrium, it is natural to reach the conclusion that any observed positive relationship between accounting profit and market concentration re reflects efficiency rather than the exercise of market power.

The efficiency hypothesis asserts that accounting profits of large low-cost firms in concentrated industries are economic rents. This argument has a weak theoretical foundation and little empirical support. Accounting profits are rents if they reflect exogenous capacity limitations. If accounting profits result from voluntary output restrictions, they are

economic profit and result from the exercise of marker power. In the latter case, the existence of cost differences among firms is a result of the exercise of market power by low-cost firms. The presence of high-cost firms should be expected if low-cost firms restrict output.

Low cost firms act as price-taker and make no attempt to restrict output. High-cost firms behave in the same way. The greater the output of low-cost firms, the greater the weight given their positive accounting profit in computing industry -average profitability. A regression of profitability on concentration for a sample of industries would find a positive relationship, but this would not reflect the exercise of market power merely the superior efficiency of low-cost firms.

Low cost firm earn an accounting profit. A sufficiently clever economist could detect a unit cost difference between large firms and fringe firms. But the existence of a cost difference does not mean that the accounting profits of the low-cost firms are an efficiency rent. In an industry, the presence of high-cost firms is a signal that low-cost firms exercise market power.

In such markets, concentration and the exercise of market power in crease the profit of large firms but not small firms. The exercise of market power would have the usual welfare consequences- an income transfer from consumers to low-cost producers, and a deadweight welfare loss. An

additional social cost is the excess cost of out put produced by high-cost firms.

The efficiency interpretation of empirical structure-conduct-performance studies has been advanced as an alternative to the market power interpretation. At a very fundamental level this is incorrect. It low-cost firm restrict output, they exercise market power and create a niche for less efficient firms. In such cases, the presences of less efficient firms are a signal of the exercise of market power, not a demonstration of its absence. A positive concentration-profitability relationship for large firms and an insignificant concentration-profitability relationship for small firms is perfectly consistent with the exercise of market power by large firms.

Demsetz' empirical tests of the efficiency hypothesis rest on the argument that the exercise of market power will raise the profit of all firms in concentrated industries.

A successful collusion is very likely to benefit the smaller firms, and this suggests that there should be a positive correlation between the rate of return earned by small firms and the degree to which the industry is concentrated. By the same token, if efficiency is associated with concentration, there should be a positive correlation between the rate of return earned by large firms and that earned by small firms; that is, large firm have become large because they are more efficient

than other firms and are able to earn a higher rate of return than other firms.

(Demstz,1973,p.5)

Bain, Collins, and Preston explicitly argued that market concentration would increase the profits of large firms but not the profits of small firms. Their empirical results were generally consistent with this expectation. Thus the hypothesis that concentration and resulting collusion raises the profit of small firms is not part of the market power interpretation of empirical studies.

In any event, Demsetz' argument incorrectly portrays efficiency differences and the exercise of marker power as mutually exclusive alternatives. Further, concentrating on collusion, Demsetz leaves aside the exercise of market power by single firms. In view of the Chicago school preference for the basic competitive model, this is not surprising. In a perfectly competitive market products are standardized. But if products are differentiated, a single firm will exercise market power if it maximizes profit. Empirical studies, from Comanor and Wilson onward, find that product differentiation has a significant positive effect on profitability and price-cost margins.

These results are consistent with the view that product differentiation allows single firms to exercise market-power. The efficiency hypothesis is silent as regards to this possibility.

Demsetz asserts, that the concentration-profitability relationship reflects efficiency differences rather than market power. His results are exactly what one would expect if large low-cost firms raise price above cost and smaller higher-cost firms enter, under the resulting price umbrella. In such a market, small firms will earn near –zero economic profit. The difference between their average rate of return and the average rate of return of large firms is greater, the greater the market power exercised by large firms. Firms with lower cost, but not as low as the largest lowest-cost firms, will show smaller rate of return differences compared with large firms.

Demsetz's efficiency hypothesis suggests a different interpretation of any positive relationship: high profits in concentrated markets could simply be indicative of greater efficiency. Demsetz proposes a method of testing this: If efficiency is associated with concentration, there should be a positive association between concentration and the difference between the rate of return earned by large firms and that earned by small firms (1973 P.5)

This can be contrasted with the market power hypothesis which makes no case for any systematic variation between the rate of return of small and large firms in industries with high levels of concentration.

If one of the largest firms in the market grows because of increased efficiency, then the market becomes more concentrated, but producing price falls. The ambiguity of the tests, and the practical problems of using profit measures, has caused several economists to turn attention to the relationship between concentration and price. Notable amongst these is Weiss (1989). He regards tests using price as superior because there is little risk that differences in accounting practices introduce data errors. Moreover, theory would expect market power to increase price, whereas greater efficiency would generally be associated with lower price. He argues that a positive relationship between concentration and price can be interpreted unambiguously as evidence of market power.

A persuasive minority suggests that monopoly may actually improve society's welfare. If the monopolist has lower costs, productive efficiency gains may outweigh the welfare losses caused by market power and empirical relationships between profit and concentration may be explained not by market power but by greater efficiency from the perspective of transaction cost economics, this superior efficiency is attributed to firm-specific factors conferring unique advantages to particular firms. Adopting

the Austrian view of competition as a process reveals that monopolies are the temporary reward for beneficial- and hence profitable-innovation.

Australian economists are well aware in an alternative view of market power. Any similarity between 'empirical snapshots' and theoretical neoclassical models is superficial and illusory. It fails to recognize the competitive process, which is continually. It fails to recognize the competitive process, which is a continually changing market structure. It pays insufficient attention to the source of market power, and it misses the point that marker power is generally transitory.

The view of competition as a continuing process remedies these detects. Monopolies may not arise from mergers or cost conditions, but simply as the result of successful products or Process innovation. It a firm introduces a new product; its success or failure depends upon consumer's responses. If sufficient consumers are willing to pay the price asked, then the product will stay on the market. Alternatively, if a loss is made, the monopolist will withdraw the product. A firm, which correctly assesses the market, will prosper and gain a monopoly position until such time as others are able to enter. To go further and conclude that, where such firm has market power, resources are inefficiently utilized is unsound.

This leads little child to offer an alternative interpretation of the welfare loss calculation. Instead of generating a welfare loss, Littlechild considers that an innovating monopolist: 'generation a social gain given by his own entrepreneurial profit plus the consumer surplus' (1981, p.358).

Society will gain further when other entrepreneurs enter this market. Entrepreneurial profit will be eroded and transfers to consumer surplus. Pezzoli (1985) is one of the few economists to make any allowance for the beneficial effects of innovation in empirical work. He excludes from his calculation of welfare loss firms in those industries where research and development expenditure is high in relation to total sales (pharmaceuticals, electrical engineering and vehicles).

Australians argue that monopolies need not be regarded with alarm as long as it is possible for rivals to erode their market positions. The profit made by a successful innovator will attract competition from other firms in the future. Even a firm with hundred percent of the market and protected by considerable entry barriers may not be able to exploit its monopoly position. If the prospects of abnormal profits are sufficiently attractive, other firms will have an incentive to break down the monopoly by developing lower-cost production processes or introducing superior products. However, profit prospects are not judged. Solely on the current profitability of established firms. Entry may occur where normal profits (or

even losses) are being made. Each firms is unique and its entry decision depends on its profit expectations (dependent on its technology, know how, management skills and so on, as well as on rival's reactions).

When competition is regarded in this light, a firm with market power must be redefined as one, which can slow down (or stop) the competitive process so as to sustain abnormal profits over longer periods of time. Although superficially similar to the neoclassical concept of barrier of the kind suggested by Bain (1956) or later neoclassical theorists (Spence, 1977;Dixit, 1982) Rather, barriers are viewed as impediments to the markets process which can not be over come through time. They are not (as in neoclassical theory) an advantage possessed by a firm at a point in time. Consequently, product differentiation or absolute cost advantages are not regarded as entry barriers because they can be eliminated by the development of new products and by changes in methods of production and distribution.

In general, the most effective barriers to entry are those imposed by the government and backed by the force of low; for instance, where governments grant legal monopolies, protect domestic markets by tariffs and other trade barriers, impose licensing requirements or grant exclusive rights to certain practices.

Public Policies should guarantee firms some market power, that is, appropriate ability of their Research & Development and investments, and competition policy should not aim at " destroying" monopolies, or more generally firms market power, as long as they are established on the basis of legitimate business practices. A firm, which enjoys a monopoly, after having successfully invested in, innovated, and introduced new products, is a firm, which receives reward for its activities.

The previous arguments suggest that competition policy should not be too interventionist. Some theories go further, and suggest that there exist market mechanisms, which prevent a monopolist from exercising market power, thereby reducing further the scope for competition policy. There is also argument that free entry acts as a restraint to the market power of a monopolist. Although it is true that potential entrants can play a role in disciplining incumbents, monopolists often continue unperturbed to change high price even when entry is possible, for a number of reasons, such as the existence of sunk costs, consumer switching costs, and network effects, as well as business practices carried out by incumbents to exclude potential entrants.

The competitive view of industry structure suggests that rapid changes in concentration are brought about by changed cost conditions. Industries experiencing rapid increases in concentration should exhibit greater

disparities between larges and small rate of return because of the more significant cost differences, which are the root cause of rapid alterations in industry structure. The monopoly view of concentration does not imply such a relationship, for if an industry is rapidly achieving workable collusive practices there is no reason to suppose that the differences between large and small firm profit rates should increase.

To test this hypothesis, Demsetz regress differences in rate of return on concentration and the change of concentration. Demsetz' expectation is that if the efficiency hypothesis explains the concentration-profits relationship, there will be a significant relationship between changes in concentration and differences in rate of return a cross firm sizes.

A simulation study by Ravenscraft (1984) based on an underlying model in which price rises with market concentration while cost fails as marker share rises, provided that market share is less than minimum efficient scale share. This specification does not allow for the possibility that firm-specific market power may mean that price-cost margins raise with market share.

Schmalensee (1987) characterizes the market concentration and efficiency hypothesis as follows:

Differential collusion Hypothesis: Industries differ in the effectiveness with which sellers are able to limit competition by tactic or explicit collusion. Collusion is more likely to be effective, and profitability is more likely to be above competitive levels, the higher is seller concentration.

Differential Efficiency Hypothesis: Effective collusion is rare or nonexistent. In some industries, long-lived efficiency differences are unimportant, and both concentration and accounting profitability are generally low. Where efficiency differences are important, efficient firms obtain large marker shares and earn rents, and both concentration and industry-level profitability are thus high Schmalensee tests these extreme versions of the two hypothesis, as well as "hybrid" hypothesis that allow for the possibility that market power and efficiency contribute to the observed positive relationship between marker concentration and profitability. He begins with the Learner index of market power for a firm that makes the cournot behavioral assumption:

$$\frac{p-c}{p} = \frac{S_i}{\varepsilon_{qp}}$$

(where P is the output price, C is marginal cost, S_i is market share and ε_{qp} is price elasticity of demand.)

under the differential efficiency hypothesis, estimation for a single industry should produce positive estimates of the rate of return on capital and the inverse of the price elasticity of demand. Similarly, the industry-

average rate of return on capital should be positive and it should be positively related to market concentration. In principle, the relationship should hold for concentration measured by the Herfindahl index. One would expect the same effect for other measures of concentration as well.

If rates of return are determined by collusion rather than differences in efficiency, and if collusion benefits all firms equally, then market share should have no particular effect on the rate of return. Estimation of the rate of return on capital would produce a positive estimates of the rate of return, but the estimate of the inverse of the price elasticity of demand would not be significantly different from zero.

It collusive behavior raises the profits of all firms, then under the differential collusion hypothesis, differences in the rate of return across industries will be positively related to differences in concentration across industries. On the other hand, if industries contain a core of collusive firm and a fringe of price-taking firms, industry-average profitability will rise as the share of the collusive core rises. In this case, differences in industry-average rate of return on capital will be positively related to differences in concentration across industries.

Adam Smiths widely scattered comments dealing with both conduct and structural features; typify the dominant strain of economic thought during

the eighteenth and nineteenth centuries. On the conduct side, Smith considered the absence of competition to be an independent striving for patronage by the various sellers in a market. Competition in Smiths schema also had a long-run dimension that could be satisfied; despite short-run aberration, as long as it was possible for resources to move from industries in which their returns were low to those in which they could earn comparatively high returns. This in turn depends up on a structural condition: the absence of to resource transfers.

In modern economic theory, a market is said to be competitive (or more precisely, pure competitive) when the number of firms selling a homogeneous commodity is so large, and each individual firm's share of the market is so small, that no individual firm finds it self able to influence appreciably the commodity's price by varying the quantity of output it sells.

The long-run equilibrium state of a competitive industry has three general properties with important normative implications:

First, the cost of producing the last unit of output-the marginal cost-is equal to the price paid by consumers for that unit. This is a necessary condition for profit maximization, given the competitive firm's perception that price is unaffected by its output decisions.

Second, with price equal to average total cost (that is, supra normal) for the representative firm, economic profits are absent. Investors receive a return just sufficient to induce them to maintain their investment at the level required to produce the industry's output efficiently.

Third, in long-run equilibrium, each firm is producing its out put at the minimum point on its average total cost curve. Firms that fail to operate at the lowest unit cost will incur losses and be driven for the industry. Thus, resources are employed at maximum production efficiency under competition.

Theory would expect market power to increase price, where as greater efficiency would generally be associated with lower price. Weiss (1989) argue that a positive relationship between concentration and price can be interpreted unambiguously as evidence of market power.

The persistence of profit can be undermined on three counts: by exogenous changes in cost and demand conditions, by competition within the market, and by entry from outside the market. Traditional theory would take the absence of new entry as evidence that entry barriers facilitate the exercise of market power by incumbents. However, this

finding could also arise because the incumbent firm possesses efficiency advantages that new entrants are unable to emulate.

More direct evidence relating to the market power hypothesis is provided by studies that have focused up on the existence and height of entry barrier. Bain (1956) pioneered this research, finding that barrier to entry lead to high profits. Amongst more recent studies, Geroski (1991 b) found barriers sufficiently high for incumbents to maintain prices 15-20 percent above costs without net entry occurring. Likewise, Anderson and Rynning (1991) showed that high entry barriers were essential to the profitability of concentrated markets.

A corollary of these findings is the expectation that high rate of entry in to a market imply an absence of marker power. Theory predicts that substantial entry would act as a force to reduce profits to normal levels. This view receives support from Jeong and Masson (1991), who found that entry to the Korean manufacturing sector caused profits to decline.

If the market comprises several strategic groups, this may provide another reason why high entry rates and high profits coexist. Some strategic groups provide an easier means of access to the market than other. Even after entry, the new comer may still find itself unable to compete effectively with firms in other strategic groups because of high barriers to mobility

with the market. Those strategic groups to which entry is very difficult may offer the prospect of high profits. This suggests that market power may not be a market- wide phenomenon; rather it may be a feature of a certain niche or segment of the marker. Even here, the welfare inferences are still ambiguous: high profits could be consistent with the dominant incumbents' possession of either market power and/ or efficiency advantages.

Bain emphasized (a) economies of large scale, (b) product differentiation, and (c) absolute cost advantages of incumbent firms compared with entrants as the main determinants of entry conditions (1956,pp.15-16).

A) ECONOMIES OF SCALE

If out put from a minimum efficient Scale plant- a plant large enough so that average cost takes its minimum value-is a significant part of the quantity demanded at a competitive price, entrants face a distasteful choice. They can come in to the market at large scale, which would certainly attract the attention and possible retaliation of incumbents or they can come into the market at small scale, and operate at a cost disadvantage compared with large firms.

Economics of scale arise if average cost falls as output rises and may simply be a characteristics of the technology. Economics of scale also arise if large firms are able to bargain with suppliers and obtain inputs at lower cost than small firms. Similarly, economies of firm scale arise if advertising and other sales efforts are more effective when carried out at large scale.

B) PRODUCT DIFFERENTATION

Homogeneity of product and insignificant size of individual sellers and buyers relative to their marker are sufficient conditions for the existence of pure competition, under which sellers posses no monopoly power.

The distinction between homogeneity and differentiation hinges on the degree of substitutability among competing seller's products. Homogeneity prevails when, in the mind of buyers, products are perfect substitutes. Products are differentiated when, owing to differences in physical attributes, ancillary service, geographic location, information, and/or subjective image, one firm's products are clearly proffered by at least some buyers over rival products at a given price. The distinguishing trait of a differentiated product is the ability of its seller to raise the products price without sacrificing its entire sales volume.

Bain saw three possible sources for product differentiation advantages of large firms. Buyers might have strong preferences for established brands and for the products of firms with established reputations. Entrant could not expect to duplicate the brand preferences or reputational advantages of incumbents immediately and would have to spend more than incumbents, per unit of output, to reach the final consumer. Patents might give incumbents legal monopolies over the use of favored products, which would make duplication by entrants either impossible or possible only on terms of licenses dictated by incumbents. Established firms might control access to major wholesale and retail outlets, implying higher per-unit distribution costs for incumbents.

C) ABSOLUTE COST ADVANTAGES

Incumbents enjoy an absolute cost advantage over entrants if patents or secrets gave them control over state-of-the-art production processes. Incumbents might control access to high quality or lower-cost input suppliers. If, as seems likely, the possibility of bankruptcy is greater for entrants than incumbents, then financial markets can be expected to impose a higher cost of capital on entrants then encumbents. The resulting absolute cost advantage will be greater, the more capital intensive production processes are.

Bain defined entry conditions in terms of the cost advantages of incumbents over entrants:

The condition of entry to an industry... refers to advantages which established firms in an industry have over established entrant firms; it is evaluated in general by measures of the heights of entry inducing prices relative to defined competitive levels.(1956 p.10)

This way of thinking about entry conditions is rooted in limit price model of oligopoly. The more difficult it is to enter a market, the more incumbents can raise price above competitive level without inducing entry. The difference between the competitive price and the entry-inducing price reflects unit costs that are borne by an entrant but not by an incumbent.

The principal problem to be tackled concerns the welfare losses arising whenever a private firm holds a dominant market position that is protected by entry barrier. Competition policy should seek to break up or to regulate existing monopolies. It should also control firms' attempts to acquire such positions by merger more generally; competition policy should try to prevent firms undertaking practices, which adversely affect competition. Since the welfare gain is likely to be directly related to the size of the market, competition policy investigations would do better to concentrate on potential abuses in the largest markets. Moreover, priority

should be given to the investigation of those markets characterized by high entry barriers, which confer the greater opportunity to exploit market power.

The argument was that a swift return to normal would testify to low entry barriers and strong competitor.

Three types of entry barrier:

i) The exclusive control of a necessary resource as well as state-made devices such as licenses, and regulations or forms intellectual property such as patents.

ii) The preference perhaps caused by reputation, image or sheer inertia, of buyers for established brands, perhaps but trussed by advertising.

iii) Economies of scale, which compel a would-be entrant to enter either a large scale, or not at all (anyone entering on a small scale would face cost penalties).

Economies of scale thus reduce the number of potential entrants to those with access to large amount of capital; to finance entry to bear the risks. Recent analysis draws attention to exit costs as well as to entry barriers. If

there are ready buyers for the equipment which an entrant has bought, entry barriers are in effect zero. To the ex tent that costs are irrecoverable ('sunk'), entrants face barriers. It should be noted that entry barriers also vary (generally falling) as hanger time-spans are considered: patents expire, economies of scale can be by passed by new technologies and established brands can be replaced by new brands which find favor with consumers.

Incumbent can create barriers. Economies of scale, for example, are produced by decisions to develop new ways of production using specialized equipment, while consumer advertising and branding can strengthen preferences. Conduct, which creates barriers deliberately, is termed 'strategic' because it attempts to influence the strategic decisions of potential competitors.

Two aspects of examining rivalry between two firms in more than one rivalry. The first is the concept of sunk costs or commitant. Incumbents wishing to deter entry face the problem of communicating their determination to resist entry (example by means of price war) to outsiders. The appearance of a retaliatory treatment may, in fact, be more important than its reality. This has led economists to consider way in which incumbents can commit themselves publicly to retaliation. Incurring sunk costs is one way of doing this. Money spent irretrievably on assets for

which there is no second-hand market for example, shows that a firm is in earnest about staying in a particular industry and by implication is ready to meet any entrant with price war. Sunk cost by an incumbent thus creates entry barriers. A second aspect is their welfare implications. Inefficiently arises when competition is limited by concentration, which in turn is bolstered by barriers. While barrier creation may be profitable for the firm, it may be a waste of resources for the system as a whole.

In the 1950, and 1960, industrial economists retested the concentration effect by creating models, which drew in barriers to entry as well as concentration, These models were often tested by means of multiple regression. In the USA, Collins and preston (1969), to cite but one instance, analyzed. 243 US 4-digit manufacturing industries for 1963, using PCM as the measure of profit and CR4 as concentration.

According to the study by Carmen. L Espana and Lopez, concentration is more likely beneficial when the degree of concentration is low and the price elasticity of demand high. For high concentrated industries, any benefits of efficiency gains are generally outweighed by market power increases.

In terms of the efficiency gains issue, with the exception of Gisser, previous estimations of food manufacturing dead weight losses have side-

stepped the possibilities of efficiency gains by the monopolist - an unresolved issue centered around the Schumpeterian hypothesis and Demsetz critique. In the end, welfare of consumers is determined by the price cost differential from oligopoly power embedded in welfare losses calculations. That is, welfare losses calculation should include technical efficiencies along with allocation inefficiencies associated with oligopoly power. This has been a recent increase in the number of new empirical industrial organizational studies that measures and test for degree of oligopoly power in the food processing industries.

An analytical framework incorporating these kinds of relationships has been extensively used in empirical studies of industries and markets in developed economies.

Attempts to measure market power and/ or efficiency in developed countries have been made by a number of studies. Here, we shall try to review some of the leading studies which are the basis for successive studies in the areas.

One of the studies of measuring market power and/ or efficiency in US manufacturing industries was S. Martin's 1988a study. In this study, Martine examines price-cost margins for subgroups of firms with in SIC four-digit industries. The subgroups are the largest four firms the fifth

through eight largest firms and remaining smaller firms. For each group, he defines a relative productivity index: value added per worker for firms in the group as a fraction of industry – average value added per worker the larger the relative productivity index is all else equal, the more productive are firms in the group compared with the industry average. If profit differences are a result of efficiency differences, group margins should rise as relative productivity index rises.

Martins' results were consistent with the presence of cost differences. Efficiency is evidently a highly significant determinant of group price – cost margins. If such cost differences are a result of capacity limits then the accounting profit they generate is an efficiency rent. If cost differences exist because low-cost firms restrict output, then the accounting profit associated with lower costs is an economic profit, reflecting the exercise of market power.

Once the influence of productivity differences is controlled for, there remains a positive effect of market concentration on price – cost margins. The share of the largest four firms has a large and significant positive effect on the margins of the fifth to the eighth firms, and a still smaller and less significant positive effect on the margins of smaller firms. Even if all the profit that the productivity variables mark up is an efficiency rent, the degree of market power is positively affected by seller concentration.

Iwata (1974) also attempted to provide one example of a methodology that can be used to analyze market power at the firm level for the Japanese flat glass. Begin with the conjectural derivation expression for a firm's learner index of market power,

$$\frac{P - C_i}{P} = \frac{S_i}{\xi_{Qp} / (1 + \theta_i)} \quad \ldots\ldots 1$$

Here it is assumed that the product is homogeneous, C_i is firm is marginal cost, S_i is firm is market share, ξ_{Qp} is the industry price elasticity of demand and $\theta_i = d\,(Q - q_i)$ is the response that firm i expects from all other firms per unit charge in dq_i its own output. Rearranging equation (1) we obtain:

$$\theta_i = \frac{(1 - c_i)}{(P)} * \frac{\xi_{Qp}}{S_i - 1} \quad \ldots\ldots (2)$$

It follows from (2) that, with estimates of C_i and ξ_{Qp} and observations P and C_i , one can obtain an estimate of firm's conjectural variation parameter θ_i. The estimate of θ_i is the value which makes the firms observed behavior consistent with profit maximizing behavior. The statistical properties of this estimate follow from the statistical properties

of the estimates of C_i and ξ_{Qp}. This approach also yields an estimate of firm is degree of market power, which is simply, $\frac{(P - C_i)}{P}$

Models of cost and demand can be tailored to the particular circumstances of the firms and markets concerned, with a detail that is possible in cross-section analysis. Conjectural variations and the degree of market power can be estimated on a firm – by – firm basis. They can be estimated over time. [The impact of inter temporal shocks (for example, discontinuous shifts in the price of oil could be included in the analysis.]

Estimates of market power and conjectural variations, by Iwata indicated that the degree of market power is relatively stable, although declining over time. Estimates of the conjectural derivative are slightly positive for window glass and slightly relative for polished plate glass; they exhibit considerable instability. In a statistical sense it is not possible to reject the hypothesis of cournot behavior for this industry. The relatively large values of the price-cost margin are consistent with what one would expect for a cournot triopoli.

Appelbaum (1982) adapted a similar approach to the use of industry – level data. A aggregation of firm – level optimality conditions to the industry level depends on two assumptions. One is that the product is

homogeneous and the other is that the conjectural elasticity is the same for all firms.

For each of the industries he studies Appelbaum estimates a constant elasticity demand curve, a system of factor share equations, and an aggregate profit maximization condition. The results yield estimates of the price elasticity of demand, the conjectural elasticity of industry output with respect to a change in the output of a single firm, and the industry – average learner index of market power.

According to the result he obtained the conjectural elasticity for the rubber and textile industries are essentially zero. This can be interpreted as a belief by firms that the industry is competitive. If firms believe that industry output does not change when their own output changes, then they believe that price is invariant to changes in their own output. The learner index for the rubber industry is not significantly different from zero. The Lerner index for the textile industry is significantly different from zero.

For the two remaining industries electrical machinery and tobacco, conjectural elasticity's and Lerner indices are both significantly different from zero. In the content of this model, it seems clear that the electrical

machinery and tobacco industries are oligopolies in which firms, on average, succeed in exercising market power.

M.J. Roberts (1984) also provides a nice example of the use of estimates of conjectural variations to test hypothesis about firm conduct in oligopolistic markets. In his theoretical model he expresses the firm's marginal revenue in terms of its market share and the conjectural derivative it holds as to the way changes in its own output affect the output of other firms. Results from duality theory lead to expressions for input demands and profit – maximizing output supply in terms of the parameters of the cost function.

This demand – supply model yields equations that are estimated for a sample of 52 firms in the US coffee roasting industry conjectural derivations for six of the 52 firms in Roberts sample (including the largest and the smallest firm) are estimated directly. The conjectural derivations reported are in fact tantalizing close to – 1. For the two largest firms, however the estimated conjectural derivations are significantly different from – 1. According to this estimates, the largest firms expect industry output to increase slightly if they expand their own output. Conjectural derivatives for four remaining firms are not significantly different from – 1, which is consistent with price – taking behavior. Roberts indicates that it is not possible to reject the hypothesis that all firms except the top two act as price – takers.

Roberts reports the results of a series of tests of market conduct. Estimated conjectural derivatives are inconsistent with the hypothesis that the largest firm acts as a dominant firm facing a competitive fringe that the two largest firms jointly act as a dominant cartel facing a competitive fringe and that all firms act as cournot oligopolists.

So far we have attempted to make a brief review of various studies made by several scholoars in the area of market power one / or efficiency in different countries.

It need be noted that, we have not come across in a study made on related area in Ethiopian food and beverages manufacturing industries that may serve as a point of reference. As a result this piece of work is expected to be the first of its kind.

CHAPTER FOUR

Methodology

4.1 Hypothesis

In the LDCs the number of firms in an industry is very small and a few of those firms constitute more than 50% of the market share of the industries output. Moreover, the size of the market is very small. This means that the concentration ratios is very high, implying the existence of oligopolistic market structure. Similarly, the Food and Beverages industries in Ethiopia are expected to exhibit the same picture as that of the Food and Beverages industries in of most LDCs. As a result, it is also expected that few firms would constitute a large share of the market.

Statistical tests to determine the presence or absence of oligopoly behavior consists of the following hypothesis test.

H_0 : L = 0 (No oligopoly power)

H_1 : L > 0 (There is a substantial degree of oligopoly power in the industry)

Fieler's theorem is used to compute asymptotic t-test for the learner index. The Fieler's theorem (Finney) is concerned with the ratio of two parameters following finery the t – test is given by:

$$t = \frac{L}{SeL}$$

Where $SeL = [\ Var\ (\Theta) - 2L\ Cov\ (\Theta\ \dot{\eta}) + L^2\ var\ (\dot{\eta})]^{0.5}$

As a system estimation approach was used, the number of observation (N) was equal to the number of equations in the system (5) times the number of years (10) i.e. N = 5 X 10 = 50 (Note: 10 = from period 1995/96 – 2004/05) unlike previous studies which tested the hypothesis:

H_o: $\Theta=0$, for price taking behavior (e.g. no strategic interaction) with out considering the effect of demand elasticity in the oligopoly power index (e.g. Azzam and Pagoulatos), this study used direct test for measuring oligopoly power in which the influence of both conjectural variation elasticity (Θ) and the market demand elasticity ($\dot{\eta}$) on the oligopoly power index are taken in to consideration. Of course, L equal to zero is a necessary condition for price – taking behavior. However, in the presence of rather inelastic product demands, a statistical test of the ratio of Θ to $\dot{\eta}$ might be more appropriate in certain situations. If one is interested in testing for the degree of oligopoly power purse rather than testing for price – taking behavior.

H_o: No oligopoly power

Vs.

H_A: Not H_o

4.2 The Model

The econometric model is dawns on the work of Clark and Davis (1982), Azzam (1997), Quagrainie et. al, 2003, and Appelbaum(1982). As Quagrainie et al, 2003 suggest, the common approach has been to assume functional form a dual cost function or a profit equation.

The first order optimality conditions (Shephards or Hotelling's Lemma) are then used to derive a system of input demands. In these models firms are hypothesized to simultaneously and independently choose their output levels given their beliefs about rivals reactions to their output choice and these beliefs are called conjectural elasticity of variations (Azzam et al, 1990). Azzam (1990) further argues that firms conjectural elasticity is its conjectural variation multiplied by its market share.

The conjectural elasticity of variations and the output demand elasticity are then used to compute a Learner index that shows the degree of market power. A Learner index value at one indicates presence of monopoly power while zero indicates perfect competition. The estimated econometric model consists of: an out put demand equation that embodies marginal revenue, three input demand equations that embody marginal cost and a pricing equation (Bhuyan et al 1997). The pricing equation is based on the profit maximizing condition that marginal revenue equals marginal cost and embodies a parameter of industry conduct. This approach has been applied by Lopez (1984) on the Canadian food processing industry and is

used in this study to test for market power in Ethiopian Food and Beverage processing industries.

Consider an oligopolistic industry with a market demand function Q = f (p , z) and, in view of the application, consider Food and Beverage industry consisting of N firms converting single material input into a final output. Q is the total industry out put, P is the Output price and z is vector of demand shifters.

The objective of each j^{th} firms is to maximize profits by choosing the right amount of q_j to produce given its cost structure.

$$\text{Max}_{\{q_j\}}\ \pi_j = [\, Pq_j - C_j(q_j, W): q = f(P, Z)\,], \text{ for } j = 1,2\ldots, k \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where q_j denotes firm j' s output , Q ($= \sum_j q_j$) is total industry output with k firms, p is the product price, $C_j(q_j, W)$ is the firms cost function, $W = (w_1, w_2, \ldots, w_n)$ is an input price vector, and P(Q) is the output demand function.

Profit maximization by the j^{th} firm will be obtained by differentiating equation (1) with respect to q_j yields:

$$P(1 - \theta_j / \eta) = \partial C_j(q_j, W) / \partial q_j \quad \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where θ_j is the j^{th} firm's conjectural variations elasticity and

$\dot{\eta} = \{\partial q_i / q\} / \{\partial P(Q)/p\}$ or

$\dot{\eta} = - \{ \partial \ln p(Q) \} / \{ \partial \ln p \}$

is the absolute value of the price elasticity of output demand. Note that the right side of equation (2) denotes the output elasticity of cost or the reciprocal of economies of size (Jorgensen).

The value of θ_j is a measure of price taking behavior and is used to test for the existence of market power. In a pure monopoly, $\theta_j = 1$ while in a competitive market $\theta_j = 0$ implying that price equals marginal cost.

Equation (1) can then be rearranged to derive the Lerner index a measure of the degree of market power as follows:

$[P - MC_j] / P = \theta_j / \eta$ ..... (3)

Using market shares $S_j = q_j / Q$ as weights, equation (2) can be written as:

$S_j - [S_j MC_j] / P = S_j \theta_j / \eta = Ł_j$..... (4)

Where $Ł_j$ is defines the j^{th} firm's Lerner index of oligopoly power. Under appropriate aggregating conditions, equation (3) can be summed up across all N firms to yield the industry aggregate Lerner index of oligopoly power (Ł)

Following Cowling and Waterson, equation (4) is used to derive the industry's Lerner index (L) to ascertain the degree of oligopoly power as follows:

$$Ł = \sum S_j L_j = -H/\eta \quad \text{..... (5)}$$

where H is the Herfindahl index (sum of the squared market shares). Equation (3) can also be aggregated to the industry Lerner index and rewritten as:

$$Ł = [P - MC] / P = \Theta / \eta \quad \text{..... (6)}$$

Where MC and Θ are industry level (weighted) marginal cost and conjectural variations. The Lerner index shows the percentage difference between price and the marginal cost (indicating the level of the mark up) and just like Θ is bounded between 0 and 1 where Ł=0 implies a competitive market while Ł=1 indicates a monopolistic market structure.

Since the firms are assumed to be price takers in the input market, Shephards lemma can be used to derive the input demands,

$$X_j = \frac{\partial C_j (q_j, w)}{\partial w} , \quad j = 1, \ldots , k$$

Where X_j is the j^{th} firms, input demand vector.

Following Olson and Shieh (1989), and Baffes and Vasavada (1989), the cost function is assumed to take the Generalized Leontief functional form:

$$C (W_i , Q, t) = Q \sum_i \sum_j b_{ij} \; W_i^{1/2} \; W_j^{1/2} + Q^2 \sum \alpha_i W_i + Q t \sum \gamma_i W_i , \ldots\ldots\ldots (7)$$

Where W_i is the price of input i (i = L, K, M) and t represents the state of technology and b_{ij} and α_i are parameters. Assuming that producers take factor prices as given and using Shepard's Lemma (Diewert 1974) the cost – minimizing input demand functions are defined by:

$$X_i = \partial C / \partial W_i = \sum_j b_{ij} + (W_j/W_i)^{1/2} Q + \alpha_i Q^2 + \gamma_i Qt \ldots\ldots \ldots\ldots\ldots\ldots (8)$$

Where X_i is the quantity demanded of input i (i = L,K,M)

It is assumed that the observed input demands are distributed stochastically about the cost – minimizing input bundles, and thus equation system (8) can be written as:

$X_{in} = \sum_j b_{ij} (W_{jn}/W_{in})^{½} Q_n + \alpha_i Q_n^2 + \gamma_i Q_n t + e_{in}$, ...(9)

Where i is K, L, T, M; Q_n is observation in period n; and e_{in} is the disturbance for input i at observation in period n.

We assume that E (e_{in}) = 0, but it is unrealistic to assume that the disturbances are homoscedastic over time. In this respect we follow Parks and assume that the disturbance variance corresponding to input i is proportional to the squared output level , i.e V (e_{in}) = $Q_n^2\sigma_i^2$. Thus assumption, although arbitrary, does not seem unreasonable, and it is convenient because if we express the factor demand equations in terms of input/ output ratios by dividing (9) by Q_n,

$X_{in} / Q_n = \sum b_{ij} (W_{jn}/W_{in})^{1/2} + \alpha_i Q_n + \gamma_i t + \mu_{in}$, i = L,K,M ..... (10)

Where $\mu_{in} = e_{in} / Q_n$ which has a homoscedastic variance equal to σ_i^2 .

To test for symmetry, two variants are estimated, one without any restrictions imposed and another one imposing the symmetry restrictions, $b_{ij} = b_{ji}$. In the latter model, the disturbance vector $\mu_n = (\mu_{ln}, \mu_{kn}, \mu_{tn}, \mu_{mn})$ will be correlated contemporaneously , which implies that the vector μ_n will have a joint distribution with non zero covariance. More over preliminary estimates strongly suggested that the disturbance were auto correlated. Accordingly, the stochastic specification is directed to consider both contemporaneous and inter temporal correlation of the disturbances,

μin first-order autocorrelation coefficients (R) is diagonal, i.e., that μ_{in}, is auto correlated with μ_{in-1} but not with μ_{jn-1} for i≠j. Thus

$$\mu_n = \mu_{n-1}R + u_n \quad \text{.....(11)}$$

Where u_n is assumed to be independently and normally distributed with E (u_n) =0 and covariance matrix φ.

To estimate the parameters of equation system (8) a Full Information Maximum Likelihood (FIML) method developed by Chow and Fair, as adapted by Wales, is used.

Taking the derivative of equation (4) with respect to w_i and q_i, we obtain the firms input demands and the pricing equation or Multiplying through equation (4) and (8) by each market share, S_i (= q_i/Q) using (7), and summing across the industry (N firms) yields, respectively, the industry wide analogy of the supply relation and factor demand function as follows:

$$P = - H (1 + \Theta) / \eta + \sum_i \sum_j \alpha_{ij} W_i \tfrac{1}{2} W_j \tfrac{1}{2} + t \sum_i \gamma_i W_i + 2 H Q \sum_i \beta_i W_i \quad \text{...(12)}$$

i.e.

$$P = - H (1 + \Theta)/\eta + (\beta_{KL} (W_K W_L)^{\frac{1}{2}} + \beta_{KM} (W_K W_M)^{1/2} + \beta_{LM} (W_L W_M)^{\frac{1}{2}}) + t \gamma_k W_k + t \gamma_l W_l + t \gamma_m W_m + 2HQ \alpha_k W_k + 2HQ \alpha_l W_l + 2HQ \alpha_m W_m + \mu_p$$

and

$$X_r / Q = \sum \sum \beta_{ij} (W_j / W_i)^{1/2} + t\gamma_i + H Q \alpha_i + \mu_r, \text{ for } r = 1, 2, \ldots, K \quad (13)$$

i.e.

$$X_K/Q = \beta_{KK} + \beta_{KL} (W_L/W_K)^{1/2} + \beta_{KM} (W_M/W_K)^{1/2} + \alpha_k HQ + \gamma_k t + \mu_k \quad (13.1)$$

$$X_L/Q = \beta_{LL} + \beta_{KL} (W_K/W_L)^{1/2} + \beta_{LM} (W_M/W_L)^{1/2} + \alpha_l HQ + \gamma_l t + \mu_l \quad (13.2)$$

$$X_M/Q = \beta_{MM} + \beta_{KM} (W_K/W_M)^{1/2} + \beta_{LM} (W_L/W_M)^{1/2} + \alpha_m HQ + \gamma_m t + \mu_m \quad (13.3)$$

Where

$Xr = \sum X_{rj}$ is the total industry employment of the r^{th} factor.

Following Azzam (1997) , Θ is treated as constant. Thus, differentiating equation (12) with respect to H yields the decomposed effects of concentration on output price:

$$\partial P / \partial H = - (1 + \Theta) / \eta + 2 Q \sum \beta_i W_i \quad (14)$$

Where the first term on the right – hand side is the oligopoly – power effect and the second is the cost – efficiency effect (or the effect of a rise in concentration on marginal cost).

A measure for the cost elasticity with respect to output is given by the ratio of industry marginal cost to average cost

$$e_{cq} = (A + 2\,HQ\,B) \;/\; (A + H\,Q\,B) \quad \text{.....(15)}$$

Where

$$A = \sum_{i}\sum_{j} \alpha_{ij} W_i m^{1/2} W_j^{1/2} + t \sum \gamma_i W_i$$

and

$$B = \sum \beta_i W_i$$

Note that e_{cq} depicts economies of size and is the inverse of the degree of returns to scale. If B = 0, constant returns exist, and the only effect of rising concentration on price is through oligopoly power (a). If B > 0, diseconomies of scale exist, and a rise in concentration raises prices through a rise in both oligopoly power (a) and cost (b). When economies of scale are present (B < 0) , the effect of a rise in concentration on price can be positive , negative , or zero, depending on whether the oligopoly power effect is larger than (a>b) smaller than (a<b), or the same as (a=b) the cost – efficiency effect, respectively

Alternatively, following Ball and Chambers, the elasticity of returns to scale (ξ_j) is expressed as the reciprocal of the elasticity of cost with respect to out put using equation (7). This is obtained by

$$\xi_s = \partial \ln c \;/\; \partial \ln q \,,$$

Accordingly, $\xi_s < 1$ corresponds to production function that exhibits decreasing returns to scale (DRS), $\xi_s = 1$ implies constant returns to scale (CRS) and $\xi_s > 1$ indicates increasing returns to scale (IRS). Thus values of equation (15) are used to test for CRS in each industry. Economies of scale (how output changes from a proportional increase in all inputs) and economies of size (how cost changes from an increase in output) are often inappropriately used interchangeably.

We test the null hypothesis that Ho:$\Theta = 0$ and measure the index of industry oligopoly power as defined by $Ł = \Theta / \eta$. In addition, Θ and L are hypothesized to be positive bounded between 0 and 1.

If the null hypothesis is accepted (constant returns to scale exist), and the only effect of rising concentration on price is through oligopoly power. If diseconomies of scale exist, and a rise in concentration raises price through a rise in both oligopoly power and cost. When economies of scale are present, the effect of rise in concentration on price can be positive, negative, or zero, depending on whether the oligopoly-power effect is larger than, smaller than, or the same as the cost-efficiency effect.

For convenience and tractability, the derived demand function facing the industry is assumed to take Cobb – Douglas form (as in Appelbaum, 1982,

and in Azzam, 1996). Thus the consumers demand for Food and Beverages is specified as:

$$\text{Ln } Q = \alpha + \eta \text{Ln}(P/d) + \xi_Y \text{Ln}(Y/d) + \xi_T \text{LnT} + \mu_q \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (16)$$

Where $\dot{\eta}$ is the price elasticity of demand in absolute value, d is the consumer price Index (CPI) (1993 = 100) which is used as a price deflator, p is the output price, Y stands for the Ethiopian National income or it is per capital Gross Domestic Product that is used as a proxy for expenditure, T is a time variable used to capture trends in test and preferences and μ_q is an error term.

In this study, as indicated earlier, we assume that Θ is constant and hence Θ = H and estimate a system of five structural equations with 10 coefficients ($\dot{\alpha}$, $\dot{\eta}$, ξ_i, β_{kk}, β_{ll} , β_{mm}, β_{kl}, β_{km}, β_{lm}, Θ and L).

Following Schroeter and Azzam (1991), the industry is assumed to employ three competitively priced inputs: Capital (k), Labor (L) and Material (M). Income (y) and time t are used as demand shifter. As indicated above, the full model of industry equilibrium consists of a pricing equation (the industry supply relation) and three input demand equations and an output demand function. The exogenous variables are Q, P, and input quantities X_k , X_L and X_m. The exogenous variables consist of input prices

(Wk, Wl, Wm), consumer income (Y measured with the gross domestic product), a trend variable (t), the consumer price index (d), and H. Since equation (7) (The Generalized Cost Function) is non-linear, the structural model is estimated using a Seemingly Unrelated Regression (SUR) approach in the STATA econometric software.

The estimation included a constant for the output demand and a disturbance term to account for those other variables that may be relevant in explaining these relationships. The output demand is measured as the quantity of inputs consumed based on the Marshallian theoretical concept that quantity demanded is a function of prices and income and is adjusted to cater for measurement and aggregation problems. Among the independent variables, per capita GDP was chosen to characterize individual purchasing power and hypothesized to positively influence the quantity demanded.

The input demands are estimated as functions of relative prices. These factor demands are typically measured as shares of the total costs of production. However, since data on production costs was lacking, the factor shares were estimated as shares of the total value of production which proxies costs in this study. The factor shares were then specified as the cost of a particular input divided by the total value of production (total revenue). In the estimation, we assume that the cost function and the

share equations are stochastic to account for technical and optimization errors respectively.

4.3 Definition of Variables

1. **Gross value of Production:** - Includes the sale value of all products of the establishment, the net change of stocks between the beginning and end of the reference period in the value of finished goods and the vale of semi finished goods, the value of industrial services rendered to others, the value of goods bought and resold without any transformation or processing, and other receipts. The valuation of Gross Value of Production is in terms of producers' values where indirect taxed are included in the value of sales of the establishment and the value of subsidies received is excluded.
2. **Revenue from sales:-** Represents the total sales value of all products and by-products during the reference year, valued at market price.
3. **Value added in the national account Concept (at market price):-** is defined as the difference between the gross value of production and industrial and non-industrial costs.
4. **Value added in the national account Concept (at basic price):-** is the difference between the gross value of

production and intermediate consumption which is adjusted for the tax on product (such as license tax).

5. **Raw material:** - Include all raw and auxiliary materials, parts and containers which are consumed during the reference year. The value of local raw materials is the value of locally produced raw materials and is the cost at the factory which includes the purchase price, transport charges, taxes and other incidental costs. The value of imported raw materials is the value of raw materials produced in the other countries and obtained directly or from local source and is the cost at the factory which includes the purchase price, transport charges, taxes and other incidental costs.
6. **Purchase of raw material:** - The amount spent by the enterprise to buy direct raw material during the year.
7. **Number employed:** - Includes all persons on the payroll whether seasonally or temporary workers. The number of seasonal and temporary workers has been adjusted to give equivalent of full-time workers.
8. **Number of engaged:-** Includes paied employees and workink proprietors. Active partners and unpaid family workers are also included here.

9. **Wage and salaries:** - Includes all payments in cash or in kind made to employees during the reference year in connection with the work done for the establishments.

10. **Fixed Capital Asses:** - Are those with a productive life of one year or move which are intended for the use of the establishment including fixed assets made by the establishment's own labor force for its own use. They are valued in this survey at book-value at the end of the reference year that is the net book value at the beginning, plus new capital expenditure minus those sold and disposed and depreciation during the reference year.

11. **Industrial cost:-** Includes the cost of raw materials, fuels, and other supplies consumed, cost of industrial services rendered by others, cost of goods bought and resold without any transformations or processing and cost of electricity consumed.

4.4 Source and type of data

The data used in this study consists of the quantity of manufactured Food and Beverage per year, industry sales of Food and Beverages per capital GDP, prices, quantity indexes for capital, labor and material input and a price deflator. All current prices are recorded in Ethiopia Birr per kilogram

while wages are given per month. Interest rate data was collected from the central Bank of Ethiopia.

The endogenous variables considered included the consumer demand for processed Food and Beverage (kgs) the factor shares and input factor price. These constituted the dependent variables for the 5 equations estimated. The exogenous variables for the output demand included, own price, and per capital GDP. All prices are deflated using the CPI (Dec. 2000) and the equation was estimated in logarithmic form. The independent variables for the factor demands included own prices and relative prices ratios. The factor shares were calculated as the cost of the inputs relative to the total values of output and the square roots of relative prices ratios were taken before estimation.

The study uses firm data on large and medium scale industries and the main source of data is the annual survey of large and medium scale manufacturing industries conducted by Central Statistical Agency (CSA). Both raw data and data form various statistical bulletins published by the agency are used in the study. Since the raw data set is in terms of value at current price, it is converted to constant price by deflating using appropriate deflators. The study covers those large and medium scale manufacturing industries at national level during the survey period 1995/96 – 2004/05. Pooled time – series data across industries were used

for the two – digit level t – test ratios. i.e. for Food and Beverage industries (CISI 15). The total number of observations at the four – digit level was ten while the total number at the two digit level, i.e. CISI $_{15}$, was 10 * 13 = 130.

The International Standard of Industrial Classification (CISI) groups the food processing industry in to 13 major activities, namely production, processing, and preserving of meat, fruit and vegetable (CISI 1511), manufacturing of edible oil (CISI 1514), manufacturing of dairy products (CISI 1520), manufacturing of flour (CISI 1531), manufacturing of animal feed (CISI 1533), manufacturing of bakery (CISI 1541), manufacturing of sugar and confectionary (CISI 1542), manufacturing of pasta and macaroni (1544), manufacturing of other non-food (CISI 1549), distilling, rectifying and blending of sprite (1551), manufacturing of wine (CISI 1552), manufacturing of malt liquors and malt (CISI 1553), and manufacturing of soft drinks (CISI 1554).

4.5 Data analysis

The study in intended to focus on the analysis of market power and/ or efficiency and the role of competition policy in Ethiopia's Food and Beverages Industries. To address this general objective, the study will focus on both descriptive and analytical approaches.

After the data is collected from secondary sources, the process of tabulation will be carried out, because, tabulation makes the data orderly and easier for presentation. After tabulation the data will be analyzed and interpreted with the help of econometric models as well as statistical tools.

The data analysis part involves cleaning, organizing and describing data. Data cleaning involves checking data for accuracy, transforming data through editing, coding and entering data into computer and developing and documenting the various measures. In describing the data, descriptive statistical analysis method will be used to calculate the frequency distribution, the central tendency and variation measures of the different variables. At this stage the data will be presented in graphs, tables and charts. Finally in the writing-up phase, findings, conclusions and recommendations will be included in the research report.

For the purpose of measuring the degree of market power, several measures have been proposed and being used in practice. The nature of the various kinds of measure of market power their strong sides and limitations are discussed below.

Measures of Market Power

Market Power is referred to as the power to raise the price above the competitive level. In other words, it is the ability to sell a product at a higher price than it actually costs to produce at a margin.

It is a relative term denoting the degree of monopoly power, which arises out of the various elements of the market structure, which gives the firm/ industry a degree of discretion in controlling the price, the output and the nature of products which it sells. While there will be a negligible power under competitive conditions which assigns a passive role to the firm, a firm with a high degree of market power will have an active role in the market (Barthwal, 1985 PP 52-53).

Perfect competition is an economic model that describes a hypothetical market form in which no producer or consumer has the market power to influence prices. According to the standard economical definition of efficiency (Pareto efficiency), perfect competition would lead to a completely efficient outcome. The analysis of perfectly competitive markets provides the foundation of the theory of supply and demand. Perfect competition is a market equilibrium in which all resources are allocated and used efficiently, and collective social welfare is maximized.

In order to test empirically the behavioral hypothesis about the firms and industries, we need a measurement of market concentration. Various quantitative indexes have been suggested for this purpose which we are going to summarize in this section. Some of them are used to measure the monopoly power of the firms and some for market concentration are closely interrelated and cannot be separated from each other in the measurement process. The degree of market concentration would vary with the monopoly power in a particular industry, or we may also say that the existing firms acquire monopoly power if market is concentrated.

The indexes that we are going to discuss here would therefore be indicating to us almost similar things with a minor difference. The measure for monopoly power would be more appropriate at firm level. They indicate the actual monopoly power exercised by the firms. The measures of concentration on the other hand would give us the potential monopoly power in the market or industry as a whole. Obviously some firms would be having monopoly power in the situation of market concentration. If the number of firms and their relative sizes in the market are changing we expect a change in the monopoly power of the firms. The concentration is therefore a necessary condition for the monopoly power although it is difficult to say that there is one to one proportionality between them.

Before discussing the indexes it will be useful here to mention some general conditions or requirements which should be satisfied by each one of them. This helps us in screening the indexes while marking the final choice for empirical work. These conditions are:

i. The measure must yield an unambiguous ranking of industries by concentration. That is the concentration curve, the graph between cumulative number of firms and cumulative percentage of market supply, should be clearly above (below) the less concentrated (the more concentrated everywhere on the graph.

ii. The concentration measure should be a function of the combined market share of the firms rather than of the absolute size of the market or industry.

iii. If the number of firms increases then concentration should decrease. However, if the new entrant is large enough, then concentration may go up.

iv. If there is transfer of sales from a small firm to a large one in the market, then concentration increases.

v. Proportionate decrease in the market share of all firms reduces the concentration by the same proportion.

vi. Merger activities increase the degree of concentration.

These conditions are based on the theoretical necessities. It may not be possible for an index of concentration to satisfy all of them. Steel the index may be useful for empirical work in the absence of a better one. So far, a perfect or best index for concentration or monopoly power has not been found. There are several measures suggested for this purpose, some of which are discussed below:

A) The concentration Ratio

This is the most popular and perhaps the simplest index for measurement of market concentration or monopoly power. It is the share of the market or industry held by some of the largest firms. The market share of such firms may be taken either in production or sales or employment or any magnitude of the market.

The firms own market share is a simple concept. It is the firms percentage share of the industry's total sales revenue, and it can range from virtually zero up to hundred percent.

Market share is the most important single indicator of the firm's degree of monopoly power. Higher market shares almost always provide higher monopoly power; where as low shares involve little or none. With in a market, monopoly power will vary in line with the market shares, rather than be some industry-wide constant that is shared uniformly by all firms.

A degree of market power usually appears when market share reaches about 15 percent. At higher shares, such as 25 to 30 percent the degree of monopoly may become quite significant, and market shares over 40 to 50 percent usually give strong market power.

Like any element, market share is important mainly as a source of profits to the firm. There is a general relationship between each firm's market share and its degree of profitability.

Concentration is the combined market share of the leading firm's, commonly based on the top four firms. Concentration shows directly the degree of oligopoly. Oligopolists may occasionally coordinate their actions as tightly as if they were a genuine monopoly, or they may compete fiercely, or they may fluctuate in the middle range. Their combined market

power is simply a diluted version of the dominance that a single firm with that market share can exert.

The concentration ratio of an industry is used as an indicator of the relative size of firms in relation to the industry as a whole. This may also assist in determining the market form of the industry. One commonly used concentration ratio is the four-firm concentration ratio, which consists of the market share, as a percentage, of the four largest firms in the industry. In general, the N-firm concentration ratio is the percentage of market output generated by the N largest firms in the industry.

Concentration is written as,

$$C = \sum_{i=1} S_i , \quad m = 4 , 8 , 20, \ldots$$

Where Si = market share of i^{th} firm in descending order. The normal practice is to take the four – firm (m = 4) concentration ratio but if a total number of firms operating in the market is large enough then one has to compute the 8^{th} firm or even 20-firm concentration ratio to assess the situation. The higher the concentration ratio, the greater the monopoly power or market concentration existing in the industry.

There are some limitations of this index. It does not take the entire concentration curve into account; it rather indicates market concentration at a point of the curve. The ranking of industries depends on the points chosen. If the point is changed there may be changes in the ranking of the industries also.

Further, the concentration ratios depend to a great extent on how the market is defined. A broad market would tend to reduce the computed concentration ratio whereas a narrow one would usually have the opposite effect. This means in the standard industrial classification, the concentration ratio would be lower for the two-digits major industry group than the ratios for the three-digits industries in the same group. The data for the finer classification of the industries may not be available, hence it may be difficult to have precise idea of market concentration using the aggregate data. There are other limitations also. The ratios do not reflect the presence or absence of potential entry of firms; they, being based upon national figures , do not say anything about the regional market power; they do not describe the entire number and size distribution of firms, only a part of that is considered by them; they do not say anything about the monopoly power of the individual firms in the market and ignore the role of imports in the domestic market. The ratios may give conflicting picture of the concentration with the use of different variables for size of the firms.

In spite of the limitations, the ratios are widely used in industrial economics. They are simple to compute, readily available for the manufacturing sector, and capable of measuring market concentration with a finer classification of the industries. They are consistent with the economic theory, as we know, that, other things being equal, monopolistic practices are likely to be in operation to a greater extent where a small number of the leading firms account for the bulk of any industry's output than where the industry's output is evenly distributed among the firms.

B) The Herfindahl index

Other indexes of concentration have been developed, in the hope of reflecting in a single number the entire size distribution of firms. Since 1980, the Herfindahl index has gained some popularity and use. Like other comprehensive indexes, it incorporates the market share of all firms. Therefore, it requires more detailed information than does the standard concentration ratio, which is based on just four firms.

The Herfindahl index, also known as Herfindahl-Hirschman Index or HHI, is a measure of the size of firms in relationship to the industry and an indicator of the amount of competition among them. It is an economic concept but widely applied in competition law and antitrust. It is defined as the sum of the squares of the market shares of each individual firm. As such, it can range from 0 to 1 moving from a very large amount of very

small firms to a single monopolistic producer. Decreases in the Herfindahl index generally indicate a loss of pricing power and an increase in competition, whereas increases imply the opposite.

It is the sum of the squares of the relative size (i.e. , market shares) of the firms in the market, where the relative sizes are expressed as proportions of the total size of the market. Symbolically, Herfindhal index:

$$H = \sum_{i=1}^{n} S_i^2 \quad , \quad i = 1 \, , 2 \, , - - - \, , n$$

Where $S_i = q_i/Q$, is output of i^{th} firm and Q is total output of all the firms in the market, and n is the total number of firms in the market. This index takes account of all firms in the market (i.e. industry). Their market shares are weighted by the market share itself. The large the firm, more will be its weight in the index. The maximum value for the index is one where only one firm occupies the whole market. This is the case of the monopoly. The index will have minimum value when the n firms in the market hold an identical share. This would be equal to 1/n, that is:

$$H = \sum_{i=1} \left(\frac{1}{(n)}\right)^2 = \frac{1}{n} \, , \quad n = 1 \, , 2 \, , \ldots n$$

H decreases as n increases. The index is simple to calculate.

It takes account of all the firms and their relative sizes; it is therefore popular in use and consistent with the theory of oligopoly because of its similarity to measures of monopoly power.

The HHI was obscure and largely ignored until the US Antitrust Division adopted it in 1982 in place of concentration ratios. This experiment has had mediocre success. The index is a pure number with virtually no real – world content, therefore it has been hard to interpret. The user typically refers immediately to the <<real >> concentration level, so as to give the HHI value some tangible meaning. Moreover, officials can only guess at the right threshold values for judging when an HHI is too high. Therefore, we learn the HHI because it is officially installed, even though on most points it is inferior to concentration ratios.

C) The Learner Index

There are some other indexes which are mainly used to measure monopoly power of a firm but some of them can be applied to the market as a whole with little modification or by simply reinterpreting the variables concerned. The learner indexes the best known of them.

The mark-up

The mark-up of firms is estimated in order to analyze their market power and the effects of increased competition on market power. The mark-ups usually reflect industry averages; increased competition does not necessarily reduce the estimated mark-up. If the increasing competition forces less productive firms with relatively low mark-ups to exit while more productive firms with higher mark-ups gain market-shares, the average mark-up may increase. (Boone et .al.2005). In order to reduce this problem, the analysis is concentrated on a disaggregated level, in both the full sample of firms and a sample restricted to large firms, where exit and entry will affect the average mark-up to a lesser extent. Further, efficiency gains and reductions in input prices may enable firms to price with a constant mark-up even if competition increases and price in the product market are reduced.

e) Price- Cost Margins

Generalizations of Lerner's (1934) expression for a monopolist's price-cost margin arise naturally in models of quantity – setting oligopoly. For a single firm in an oligopoly producing a homogeneous product, the price – marginal cost ratio is

$$\frac{P - MC_i}{P} = \frac{\alpha_i + (1 - \alpha_i) S_i}{\xi_{Qp}}$$

α_i is firm is conjectural elasticity parameter and S_i is firm is market share. MC_i is firm i's marginal cost.

For the moment suppose returns to scale are constant then marginal cost equals average cost, and the price – cost marginal cost margin is the

$$L = H + \sum_{i=1}^{n} S_i (1 - S_i) / \xi_{Qp} \text{ - - - - (6 a)}$$

$$L = \alpha + (1 - \alpha) H / \xi_{Qp} \text{ - - - - -} \qquad (6b)$$

Where (6b) holds if $\alpha i = \alpha$ for all i. if firms independently maximize profit, maintaining conjectures about rivals reactions, structural relations ships emerge between market share and firm market power and between the Herfindahl index and industry – average market power. For this reason and because the Herfindahl index combines information about the number and the size distribution of firms, it is usually regarded as the preferred measure of market concentration.

The Lerner index is expressed as,

$$L = \frac{\text{Price-Marginal Cost}}{\text{Price}}$$

We know, under perfect competition price will be equal to marginal cost. If there is a difference between the two, such that price greater than marginal cost, this is because of market imperfection or what we call as the monopoly power of the firm. Greater the deviation between price and

marginal cost, higher the monopoly power of a firm. The steps to derive the index are straight forward. Writing the expression for marginal revenue (MR) for a monopoly firm we get,

$MR = P (1 + 1/e_p)$

e_p = price elasticity of demand , and for profit maximization we have the familiar condition,

$MR = MC$

From these two equations we get the Lerner Index as,

$$\frac{P - Mc}{P} = 1/ e_{p=L} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 1$$

$e_p < 0$, so $-1/ e_p > 0$

that is , the index is inverse of the price elasticity of demand.

We have already derived an equation earlier which may be analyzed further to answer this question. This equation is $MR = P (1 + H e_p)$

Where H is the Herfindahl index of concentration and $e_c = 1/ e_p$ = quantity elasticity of price, MR = average marginal revenue for the market and P = average price. Similarly, let MC be average marginal cost for the market; we thus get the Learner index for the market as,

$$\frac{P-MC}{P} = -H.\ e_c = -\ H/e_p; \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 2$$

$e_p < 0$, so $-H/e_p > 0$

For one firm industry (H=1) this converges to the conventional lerner index shown by equation (1). The greater the market concentration the greater will be the average Learner Index for the firms, ceteris paribus. The lerner index is based upon static price theory. It is argued that this index measures the actual monopoly power of a firm and not the potential one. This is , however , not justified. If we incorporate a concentration index H in the formula and take price and marginal cost as average for the industry as in the second formula (i.e equation 2) we are in fact measuring the potential monopoly power in the market as whole or for the firms in that market.

CHAPTER FIVE

EMPERICAL RESULTS

5.1 RESULTS OF TRADITIONAL METHOD

The measurement of the degree of concentration of the Ethiopian Food and Beverages Manufacturing industries is carried out by Industrial

Classification of International Standard (ICIS). In carrying out the measurement of Industrial concentration, one may use sales value added, output, production capacity or value of assets as a unit of measurement of market share. But, shares of sales or value added are the best unit of measurement. As a result we have also used shares of sales as a unit of measurement of market share in this analysis.

Of the various kinds of concentration measures available for use to carry out similar analysis, the concentration ratio and the Herfindhail index have been chosen as a tool in this paper. The selection of these measures of concentration mainly stems from the advantages of the measures over the others and simplicity of the computation required.

Table 5.1 – Concentration measures for Ethiopian Food and Beverages Manufacturing industries, 2004/05.

No ICI	Industry	4-Firm Concentration ratio (%)	Herfindahl Index H X 100
1511	meat, fruit and vegetable	92.71	31.08
1514	edible oil	66.07	15.84
1520	dairy products	100.00	55.60
1531	flour	27.21	3.94
1533	animal feed	99.42	32.84
1541	bakery	44.83	7.29
1542	sugar and confectionary	99.45	33.55
1544	pasta and macaroni	88.79	25.09

1549	food NEC	80.26	17.74
1551	sprite	96.70	48.36
1552	wine	100.00	100.00
1553	malt liquors and malt	72.56	16.34
1554	soft drinks	86.72	22.70

Source: Calculated from the data in the Annex

The analysis using 2004/05 data shows the concentration level of the Ethiopia Food and Beverages industries classifying the existing establishment in to thirteen broadly categorized industries.

Table 5.1 shows concentration measure of the Food and Beverages manufacturing industries using the concentration ratio and Herfihdhal index.

As the table indicates the level of concentration vary widely across the industries. The four-firm concentration ratio has a range of variation from 27 % in flour to 100 % in wine and dairy products. Taking 50 % and above as high concentration range 85 % of the Food and Beverages manufacturing industries fall in this category namely meat, fruit & edible oil, dairy products, animal feed, sugar and confectionary, pasta & macaroni, food NEC, sprite, wine, malt liquors & malt, and soft drinks. The remaining two industries namely flour and bakery are in the lower concentration category, i.e. less than 50 %.

Similarly the Herfindhai index has a range of variation from 3.94 % in Flour to 100% in Wine. If we assume 25 % and above as the range for high concentration and less than 25 % for low concentration there are seven Food and Beverages industries in the high cadre and the remaining six in the lower cadre.

Wine industry indicates a very high level of concentration, i.e., 100 % as measured by both concentration and Herfindhal index. This implies the existence of one firm in the industry having a monopoly power in the market or industry.

On the other hand, industries like flour and bakery are relatively speaking more competitive, that the number of firms in these industries is larger, resulting in a lower concentration levels.

5.2 RESULTS OF THE ECONOMETRIC MODELS

Table 5.2 presents the estimated oligopoly Lerner indices (L), Conjectural variation elasticities (Θ), and absolute values of output demand elasticities (η) for 13 Ethiopian Food and Beverages manufacturing industries for the period 1996/97 to 2004/05.

Table 2: estimated oligopoly Lerner indices (L), Conjectural variation elasticities (Θ), and absolute values of output demand elasticities (η)

ICIS	Industry	Θ	s.e	t	p	η	s.e	t	p	L
1511	meat, fruit and vegetable	-0.0084	0.0009	-9.8200	0.0000	-0.4296	0.2531	-1.7000	0.0960	0.0197
1514	edible oil	-0.0032	0.0002	-17.1300	0.0000	-0.1948	0.0660	-2.9500	0.0040	0.0163
1520	dairy products	-0.0256	0.0047	-5.5000	0.0000	-0.2061	0.3055	-0.6700	0.5150	0.1242
1531	flour	-0.0014	0.0001	-27.3500	0.0000	0.1537	0.0523	2.9400	0.0030	0.0092
1533	animal feed	-0.0162	0.0017	-9.4100	0.0000	0.1336	0.2088	0.6400	0.5280	0.1216
1541	bakery	-0.0018	0.0001	-22.6400	0.0000	-0.1196	0.0271	-4.4100	0.0000	0.0153
1542	sugar and confectionary	-0.0048	0.0003	-18.8000	0.0000	-0.1113	0.2518	-0.4400	0.6600	0.0434
1544	pasta and macaroni	-0.0130	0.0015	-8.4800	0.0000	0.0768	0.1555	0.4900	0.6250	0.1687
1549	food NEC	-0.0046	0.0003	-14.8500	0.0000	0.1201	0.1718	0.7000	0.4870	0.0387
1551	sprite	-0.0140	0.0011	-12.6100	0.0000	-0.1880	0.1488	-1.2600	0.2110	0.0746
1552	wine	-0.1217	0.0079	-15.4700	0.0000	-0.0262	0.0999	-0.2600	0.8060	4.6424
1553	malt liquors and malt	-0.0162	0.0006	-28.0100	0.0000	-0.0187	0.0474	-0.3900	0.6950	0.8675
1554	soft drinks	-0.0065	0.0005	-14.0400	0.0000	-0.0722	0.1244	-0.5800	0.5640	0.0895

The average conjectural elasticities (Θ_i) were assumed to be constant through the entire period and were significantly different from zero at 95 percent level. The hypothesis of price taking behavior (Ho: $\Theta=0$) is therefore rejected. Implying that the Food and Beverages manufacturing industries in Ethiopia do not behave competitive.

The ratio of Θ and η were used to compute the Lerener index that on average ranges from 0.009 for Flour (ICIS 1511) to 4.64 for Wine(ICIS 1552). These Lerener indices support the finding from the concentration ratios.

In terms of economies of size, the results reveal that 12 (92.3 %) industries have significant diseconomies of size, and the remaining one industry (Sugar and confectionary (ICIS 1542)) did not reject the constant returns to size hypothesis at the 5 percent level of significance.

Table 5.3 presents the results based on equation (14) for the separate effects of changes in the Herfindahil index on oligopoly- power and cost efficiencies.

In terms of oligopoly power, at the 5 % level, the results indicate that 4 of the 13 industries (31%) significantly increase oligopoly- power as concentration increases.

Table 3: The separate effects of changes in the Herfindahil index on oligopoly-power (OP) and cost efficiencies (CE).

ICI	Indistry	CE	s.e	t	p	OP	s.e	t	p
1511	meat, fruit and vegetable	-1047.217	255.425	-4.100	0.000	928.050	209.269	4.430	0.000
1514	edible oil	1531.161	547.808	2.800	0.006	-2280.195	688.225	-3.310	0.001
1520	dairy products	-6.248	64.417	–0.100	0.925	-97.632	164.032	-0.600	0.568
1531	flour	-4421.728	1515.851	–2.920	0.004	5758.368	2512.855	2.290	0.023
1533	animal feed	-145.429	105.403	–1.380	0.180	186.128	158.246	1.180	0.251
1541	bakery	986.039	479.021	2.060	0.040	-1488.677	603.310	-2.470	0.014
1542	sugar and confectionary	441.248	349.862	1.260	0.214	-560.709	450.102	-1.250	0.219
1544	pasta and macaroni	348.750	206.240	1.690	0.104	-230.658	320.595	-0.720	0.480
1549	food NEC	280.758	1003.439	0.280	0.781	50.334	1062.498	0.050	0.962
1551	sprite	-30.988	75.362	-0.410	0.683	49.170	131.448	0.370	0.710
1552	wine	12.283	104.311	0.120	0.912	7.831	125.105	0.060	0.953
1553	malt liquors and malt	-248.017	572.394	-0.430	0.667	-989.113	1167.326	-0.850	0.404
1554	soft drinks	-189.635	457.453	-0.410	0.680	-211.797	759.989	-0.280	0.782

For the remaining six industries, increases in concentration do not result in significant increases in oligopoly power.

In terms of cost effects, the results indicate that the 4 industries (31 %) show significant gain (at the 5% of level) in cost efficiency with concentration while nine do not show a significant impact of concentration in cost efficiency.

CHAPTER SIX

Conclusion and Recommendation

As explained earlier, the main objective of this study is to examine the market behavior of processing firms in the Food and Beverages industries in Ethiopia using New Empirical Institutional Organization (NEIO) framework. The estimated conjectural variation elasticities and Lerener indices indicated that the sector was anti-competitive in the period under analysis. The empirical results of this study show processors realizing far more benefited than consumers. That is the five industries [Meat, fruit and vegetables (ICIS 1511), Edible oil (ICIS 1514), Flour (ICIS 1531), Bakery (ICIS 1541), and Pasta and Macaroni (ICIS 1544)] realized cost savings from higher concentration, but instead of passing these saving on to consumers, they used their enhanced market power to rise prices above competitive levels.

Since these industries of Ethiopia operate under imperfect competition and firms benefit the cost efficiency, import or foreign investments on the processing sector is more likely to increase the competition level. Hence the competition would force the firms to operate in a more competitive environment and leads consumers to benefit from the low price.

Higher concentration may lead to the emergence of firms with a monopoly power. Hence, government intervention is required to regulate industries, to set certain critical level of concentration and to prohibit any concentration above that level, or design policies that would encourage

entry of new firms into concentrated industries, or in other words, avoid certain barriers to entry to promote competition. So that efficiency would be raised and the welfare of society maximized.

It is expected that as the Food and beverages manufacturing sector expand, the concentration measures might decline as the consequence of the expansion of domestic markets. However, the influence of other variables on these measures is uncertain, and there is no guarantee that a decline in market power level will occur unless specific governmental measures are taken to promote it. The expansion of the sector is possible only when favorable investment and operation atmospheres are created and sustained. On this part, the state plays a major role. It should commit itself to encourage and strengthen private investors by designing policies that increase its credibility and avoid unnecessary bureaucratic channels.

The above analysis also has some implications for policies which aim at maximizing social welfare and creating a greater competitive environment in the Food and Beverages manufacturing industries. Consumers are paying higher than competitive price for produced goods and these prices can be driven down with policies that control concentration and/or pricing behavior.

Addressing anti-thrust law and anti-competitive behaviors (like cartelization, abuse of dominance, merger and acquisitions ...) that hindered the participation of new entrants would make inefficient firms more successful in achieving cost efficiency gain and reduction of market power of dominant firms.

Economies, where most markets have many producers competing for sales, are likely to be more dynamic. Even small economies can have many competitors in their markets if they are open to competitors from outside

their borders- by eliminating trade barriers such as low or no-tariffs. Ensuring competitive markets is not just a matter of governments not impeding them- it also requires active step to promote competition and breakdown cartels. Reforms to improve competition in these ways are the focus of the currently established Ethiopian Commodity Exchange Authority and the Investigation Commission under the Ministry of Trade and Industry. The ministry is the highest body authorized to deal with the implementation of the trade practice proclamation No. 329/2003- the competition law. The commission, under the ministry, was also established to follow up the day-to-day implementation of the provisions regularly. The commission is accountable to the ministry and its mandate is to make investigations upon a formal complaint from a commercial entity. The ministry can either fully accept, or alter, or totally drop the decision of the commission. So the Commission has no final say on competition matters. Moreover the commission does not have its own budget. However, the 2002 World Bank report indicated that 63 percent industrial countries and 59 percent in developing countries of the surveyed firm competition authorities are independent of ministries. Moreover, Russell C. Parker 1976 indicated that, the wave of food pricing increases that begun in 1972 in US caused Food to be a focal point of public concern like now here in Ethiopia. Both the US Federal Trade commission (FTC) and the Department of Justice responded to the concern by increasing dramatically the amount of their resources spent on investigations involving Food processing and retailing companies. In 1975 FTC spent about a fifth of its total antitrust resources in the area. Therefore, based on US experience we recommend that the commission should have its own budget and be independent of the ministry so as to perform the antitrust policy efficiently.

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Table 2.1 Number of Establishments for the period 2001/02(1994E.F.Y) - 2005/06(1998E.F.Y)

ICI	Industry	Number of Establishments				
		1994	1995	1996	1997	1998
15	Total	282	288	322	370	373
1511	Meat, fruit and vegetable	9	9	8	7	8
1514	Edible oil	30	27	28	26	33
1520	Dairy products	2	3	3	3	3
1531	Flour	60	63	75	74	90
1533	Animal feed	3	3	4	5	5
1541	Bakery	124	127	141	192	160
1542	Sugar and confectionary	12	10	12	10	14
1544	Pasta and macaroni	3	5	6	7	6
1549	Non Food	9	10	12	11	16
1551	Sprite	11	12	9	14	11
1552	Wine	1	2	1	2	2
1553	Malt liquors and malt	7	7	8	7	8
1554	Soft drinks	11	10	15	12	17

Source: CSA Report on Large and Medium Scale Manufacture and Electricity Industries Survey

Table 2.2 Distribution of Food and Beverages manufacturing industries by Regional States* 1998 EFFY(2005/06)

ICI	Industry	Regional States											
		Tigray	Afar	Amhara	Oromiya	Somalie	SNNP	Gambella	Harari	Addis Ababa	Dire Dawa	Total	%
	%	8.36	0.40	9.41	14.95	0.48	8.44	0.16	1.53	54.26	2.01	100	
	Total	104	5	117	186	6	105	2	19	675	25	1244	100.00
15	Food and Beverages	22	0	37	76	4	25	1	4	193	11	373	29.98
16	Tobacco Products	0	0	0	0	0	0	0	0	1	0	1	0.08
17	Textile	4	2	5	1	0	4	1	0	24	1	42	3.38
18	Wearing Apparel except fur apparel	2	0	0	1	0	2	0	0	25	1	31	2.49
19	Leather	1	0	6	10	0	0	0	0	46	0	63	5.06
20	Wood and Wood products except furniture	0	0	1	5	0	3	0	0	20	0	29	2.33
21-22	Paper and paper products	4	0	2	4	0	1	0	1	73	2	87	6.99
24	Chemicals	1	0	0	8	0	1	0	0	43	0	53	4.26
25	Rubber and plastic	2	0	0	11	0	0	0	0	49	1	63	5.06
26	Other non-metallic products	18	3	23	29	0	19	0	2	56	2	152	12.22
27	Iron and Steel	1	0	3	1	0	0	0	0	13	0	18	1.45
28	Metal products	22	0	8	10	0	7	0	1	57	1	106	8.52
29	Machinery and equipments	0	0	0	1	0	0	0	0	11	1	13	1.05
34	Motor vehicles	1	0	0	1	0	0	0	0	9	0	11	0.88
36	Furniture	26	0	32	28	2	43	0	11	55	5	202	16.238

Source: CSA Report on Large and Medium Scale Manufacture and Electricity Industries Survey

* The Benishangul-Gumuz Region was not covered, as there were no manufacturing establishments that fall within the scope of the survey.

Table 2.3 Number of Persons engaged for the period 2001/02(1994E.F.Y) - 2005/06(1998E.F.Y)

ICI	Industry	Number of persons Engaged				
		1994	1995	1996	1997	1998
15	Total	29133	30840	31589	32096	35934
1511	Meat, fruit and vegetable	2231	2208	1481	1230	1508
1514	Edible oil	1207	1518	1295	1192	1754
1520	Dairy products	648	628	758	647	690
1531	Flour	3646	3880	4628	4316	4024
1533	Animal feed	162	172	239	178	176
1541	Bakery	4090	4342	4312	6311	5900
1542	Sugar and confectionary	6930	7528	6951	6800	8819
1544	Pasta and macaroni	476	568	1043	1045	1060
1549	Non Food	813	967	1196	1233	1842
1551	Sprite	899	922	1180	995	1070
1552	Wine	534	492	462	345	543
1553	Malt liquors and malt	3449	3345	3659	3612	3916
1554	Soft drinks	4048	4270	4385	4192	4632

Source: CSA Report on Large and Medium Scale Manufacture and Electricity Industries Survey

Table 2.4 Number of employees for the period 2001/02(1994E.F.Y) - 2005/06(1998E.F.Y)

ICI	Industry	Number of Employees				
		1994	1995	1996	1997	1998
15	Total	28860	30570	31359	31693	35660
1511	Meat, fruit and vegetable	2231	2208	1481	1230	1508
1514	Edible oil	1175	1473	1256	1160	1715
1520	Dairy products	648	627	757	646	689
1531	Flour	3601	3849	4587	4264	3963
1533	Animal feed	162	171	238	177	172
1541	Bakery	3926	4170	4190	6006	5748
1542	Sugar and confectionary	6916	7521	6937	6794	8810
1544	Pasta and macaroni	476	566	1041	1043	1058
1549	Non Food	809	957	1186	1231	1841
1551	Sprite	885	921	1180	993	1065
1552	Wine	534	492	462	345	543
1553	Malt liquors and malt	3449	3345	3659	3612	3916
1554	Soft drinks	4048	4270	4385	4192	4632

Source: CSA Report on Large and Medium Scale Manufacture and Electricity Industries Survey

Table 2.5 Percentage distribution of value added* for the period 2001/02(1994E.F.Y) - 2005/06(1998E.F.Y)

ICI	Industry	Percentage distribution of value added				
		1994	1995	1996	1997	1998
15	Total	45.35	46.97	44.99	41.87	40.31
1511	Meat, fruit and vegetable	1.94	1.74	0.71	0.54	0.31
1514	Edible oil	0.54	1.07	0.63	0.05	1.03
1520	Dairy products	0.57	0.62	0.72	0.73	1.12
1531	Flour	3.13	2.69	2.21	1.43	1.54
1533	Animal feed	0.05	0.03	0.05	0.06	0.09
1541	Bakery	2.17	1.91	1.51	2.13	1.77
1542	Sugar and confectionary	19.47	24.45	21.78	16.69	16.37
1544	Pasta and macaroni	1.03	0.70	1.20	0.99	0.79
1549	Non Food	1.02	0.88	1.22	1.14	1.22
1551	Sprite	1.13	0.93	1.03	1.97	1.19
1552	Wine	0.36	-0.19	0.61	0.86	0.80
1553	Malt liquors and malt	9.19	7.78	8.92	8.50	9.85
1554	Soft drinks	4.75	4.36	4.41	6.78	4.23

Source: CSA Report on Large and Medium Scale Manufacture and Electricity Industries Survey

* In the national Account concept at Basic price.

Table 2.6 Ratio of Imported to consumed total Raw material cost for the period 2001/02(1994E.F.Y) - 2005/06(1998E.F.Y)

ICI	Industry	Ratio of Imported to consumed total Raw material cost				
		1994	1995	1996	1997	1998
15	Total	0.250	0.220	0.214	0.205	0.206
1511	Meat, fruit and vegetable	0.130	0.125	0.347	0.352	0.190
1514	Edible oil	0.001	0.010	0.022	0.004	0.134
1520	Dairy products	0.166	0.162	0.167	0.186	0.179
1531	Flour	0.142	0.119	0.041	0.050	0.045
1533	Animal feed	0.000	0.000	0.000	0.053	0.270
1541	Bakery	0.119	0.079	0.082	0.138	0.235
1542	Sugar and confectionary	0.257	0.166	0.159	0.188	0.175
1544	Pasta and macaroni	0.000	0.016	0.305	0.009	0.240
1549	Non Food	0.048	0.074	0.020	0.023	0.001
1551	Sprite	0.120	0.688	0.281	0.758	0.384
1552	Wine	0.492	0.410	0.000	0.361	0.479
1553	Malt liquors and malt	0.358	0.367	0.432	0.462	0.552
1554	Soft drinks	0.630	0.698	0.631	0.365	0.434

Source: CSA Report on Large and Medium Scale Manufacture and Electricity Industries Survey

Table 2.7 Value added in the National Account concept (at Basic price) for the period 2001/02(1994E.F.Y) - 2005/06(1998E.F.Y)

ICI	Industry	Value added in the National Account concept(at Basic price)				
		1994	1995	1996	1997	1998
15	Total	1006926	1211849	1281389	1268786	1482175
1511	Meat, fruit and vegetable	43070	44838	20338	16318	11422
1514	Edible oil	11920	27659	17901	1383	37920
1520	Dairy products	12553	16007	20371	22053	41345
1531	Flour	69587	69512	62986	43259	56463
1533	Animal feed	1092	864	1499	1874	3185
1541	Bakery	48194	49227	43060	64577	65016
1542	Sugar and confectionary	432224	630884	620279	505757	601940
1544	Pasta and macaroni	22936	18045	34095	29939	29011
1549	Non Food	22579	22618	34609	34600	45013
1551	Sprite	25037	23876	29299	59810	43581
1552	Wine	8095	-4919	17243	26156	29535
1553	Malt liquors and malt	204089	200803	254010	257677	362151
1554	Soft drinks	105550	112435	125699	205383	155593

Source: CSA Report on Large and Medium Scale Manufacture and Electricity Industries Survey

Table 2.8 Wage and salaries paid for the period 2001/02(1994E.F.Y) - 2005/06(1998E.F.Y)

ICI	Industry	Wage and salaries paid				
		1994	1995	1996	1997	1998
15	Total	269470	289313	303486	323711	390745
1511	Meat, fruit and vegetable	17105	15212	10270	8776	13716
1514	Edible oil	7729	8655	8931	8109	12741
1520	Dairy products	3377	4397	5174	4313	5153
1531	Flour	21447	23903	23591	25743	23706
1533	Animal feed	705	822	706	736	714
1541	Bakery	17520	18010	16548	22270	27846
1542	Sugar and confectionary	85649	89722	94777	99738	122252
1544	Pasta and macaroni	3528	4873	10989	9996	11403
1549	Non Food	4695	4888	5485	6212	9398
1551	Sprite	9294	9249	10433	9638	10910
1552	Wine	3795	4284	5430	3800	9166
1553	Malt liquors and malt	41141	47543	52438	64511	72488
1554	Soft drinks	53485	57755	58714	59869	71252

Source: CSA Report on Large and Medium Scale Manufacture and Electricity Industries Survey

Table 2.9 Gross value of production for the period 2001/02(1994E.F.Y) - 2005/06(1998E.F.Y)

ICI	Industry	Gross value of production				
		1994	1995	1996	1997	1998
15	Total	3136320	3577430	3996066	4418420	5403839
1511	Meat, fruit and vegetable	110546	125399	61888	57517	61688
1514	Edible oil	81450	115716	110267	109810	176410
1520	Dairy products	40439	50510	60239	67964	99013
1531	Flour	363751	466328	517225	448212	522026
1533	Animal feed	4230	5721	13439	15840	14893
1541	Bakery	204254	207555	207382	284689	379145
1542	Sugar and confectionary	887506	1166483	1274026	1231542	1483017
1544	Pasta and macaroni	77905	106590	183091	192840	191476
1549	Non Food	62145	69606	106845	139381	485563
1551	Sprite	70810	76337	91879	131090	137106
1552	Wine	26650	39680	49297	58765	72212
1553	Malt liquors and malt	686414	671639	773631	927335	1116994
1554	Soft drinks	520220	475866	546857	753435	664296

Source: CSA Report on Large and Medium Scale Manufacture and Electricity Industries Survey

Table 2.10 Value added in the national account concept (at market price) for the period 2001/02(1994E.F.Y) - 2005/06(1998E.F.Y)

ICI	Industry	Value added in the national account concept (at market price)				
		1994	1995	1996	1997	1998
15	Total	1568373	1865215	2030009	2077748	2401699
1511	Meat, fruit and vegetable	47373	52220	27009	21926	20079
1514	Edible oil	19391	40795	30215	17576	59263
1520	Dairy products	14444	19777	24299	23974	43580
1531	Flour	84335	101205	108233	85172	103434
1533	Animal feed	1404	1559	3190	3578	4922
1541	Bakery	57990	58907	49328	78503	79096
1542	Sugar and confectionary	582541	866071	872591	743625	883134
1544	Pasta and macaroni	24753	29842	57298	54345	51101
1549	Non Food	26732	26702	43591	45837	57965
1551	Sprite	53118	53257	61594	95284	92729
1552	Wine	15675	6399	30719	27525	48451
1553	Malt liquors and malt	396127	381033	458406	500348	634972
1554	Soft drinks	244490	227448	263536	380055	322973

Source: CSA Report on Large and Medium Scale Manufacture and Electricity Industries Survey

Table 2.11 Total value of Fixed assets for the period 2001/02(1994E.F.Y) - 2005/06(1998E.F.Y)

ICI	Industry	Total value of Fixed assets				
		1994	1995	1996	1997	1998
15	Total	2785813	2506326	2269164	2405593	2684859
1511	Meat, fruit and vegetable	109487	106252	86010	71949	69135
1514	Edible oil	216683	175743	168546	163843	158987
1520	Dairy products	31386	26753	25543	18961	24225
1531	Flour	256951	255451	314019	292626	334272
1533	Animal feed	821	929	7607	7112	3179
1541	Bakery	117772	132740	99786	182249	235172
1542	Sugar and confectionary	927536	737913	538903	556935	690859
1544	Pasta and macaroni	23169	33276	59486	48958	75923
1549	Non Food	194282	123346	114739	65575	128960
1551	Sprite	10998	19954	20497	34649	37375
1552	Wine	16814	14715	12468	25257	18325
1553	Malt liquors and malt	615261	606402	568244	671854	631863
1554	Soft drinks	264653	272852	253316	265625	276584

Source: CSA Report on Large and Medium Scale Manufacture and Electricity Industries Survey

Table 2.12 New capital expenditure for the period 2001/02(1994E.F.Y) - 2005/06(1998E.F.Y)

ICI	Industry	New capital expenditure				
		1994	1995	1996	1997	1998
15	Total	266324	282990	216795	376689	483576
1511	Meat, fruit and vegetable	1772	4134	0	5074	3222
1514	Edible oil	2321	776	4434	3310	2874
1520	Dairy products	2853	2326	2671	2935	8889
1531	Flour	32540	19248	22880	45271	41385
1533	Animal feed	184	299	879	338	605
1541	Bakery	5887	23024	11480	18477	16733
1542	Sugar and confectionary	119106	85238	62767	86598	92907
1544	Pasta and macaroni	868	9781	2988	2617	68210
1549	Non Food	12494	1224	8424	3503	25053
1551	Sprite	3481	9954	4319	5889	16944
1552	Wine	1174	1656	1292	1096	9050
1553	Malt liquors and malt	47281	55886	65384	177150	168975
1554	Soft drinks	36363	69444	29277	24431	28729

Source: CSA Report on Large and Medium Scale Manufacture and Electricity Industries Survey

DECLARATION

I, the undersigned, declare that this thesis is my own original work ar has not been presented in any University. All sources of materials f this thesis have been fully acknowledged.

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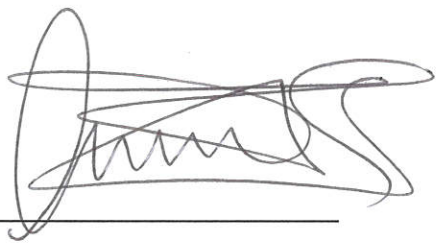

Signature:_____

Date : June 30, 2008

Place : Addis Ababa

Ethiopia

Table 2.13 Operating supply for the period 2001/02(1994E.F.Y) - 2005/06(1998E.F.Y)

ICI	Industry	Operating supply				
		1994	1995	1996	1997	1998
15	Total	735766	918056	973970	942880	1090378
1511	Meat, fruit and vegetable	25812	29520	9756	7285	-2296
1514	Edible oil	4063	18817	8827	-6861	25010
1520	Dairy products	9153	11593	15196	17726	36117
1531	Flour	47696	45185	39059	17324	32566
1533	Animal feed	380	40	769	1095	2456
1541	Bakery	30507	30969	26240	42101	36910
1542	Sugar and confectionary	346444	541030	524787	405330	479604
1544	Pasta and macaroni	19171	13030	23060	19936	17566
1549	Non Food	17736	17468	29083	28381	35584
1551	Sprite	15724	14605	18786	50132	32619
1552	Wine	4300	-9213	11814	22296	20364
1553	Malt liquors and malt	162864	152988	201458	192707	289615
1554	Soft drinks	51916	52024	65135	145428	84263

Source: CSA Report on Large and Medium Scale Manufacture and Electricity Industries Survey

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BELACHEW GETACHEW W/AMANUAEL

JUNE 2008