

MILE Program
World Trade Institute



Thesis
Cartel in the poultry market in Peru: Its impact on prices

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1. Introduction

Cartels are formed because, by coordinating their production and pricing -acting as a monopolist-, firms have the incentive to increase their profits (collective and individual). The main losers in this situation are consumers, who have to pay higher prices.

The government can address these situations that deviate from the competitive model by providing price incentives (imposing taxes on certain activities in order to make them less attractive) or by enforcing antitrust activities. In fact, the purpose of antitrust measures is to promote competition in order to make sure that prices effectively respond to market forces and are not the result of private conducts aiming at taking advantage of their privileged position. In particular, in the case of cartel prosecution, the purpose of the antitrust activity is to bring the market back to a competitive situation, where producers act independently and compete with each other having the subsequent effect on lower prices. This is under the assumption that a cartel serves only to raise prices. However, if the purpose of a cartel is to reduce costs for all its participants, then cartel prosecution would raise prices.

There are some empirical questions that are very relevant to answer when assessing the impact of antitrust activities on markets: does cartel prosecution raise or reduce prices in the market? to what extent antitrust activities are effective in their purpose of reducing prices?. The objective of this study is to answer to these questions based on the Peruvian experience of cartel prosecution. In particular, this study will be focused on the impact of cartel prosecution on the Peruvian poultry market.

The study has the following structure: the second section covers the theoretical framework related to the analysis of cartels; their rationale; the conditions for their success and also, it contains a review of the empirical work done so far on this subject. The third section provides a description of the case and of some other factors affecting it: the legal framework of cartel prosecution in Peru and the description of the "live" poultry market. The fourth section deals with the methodology to assess

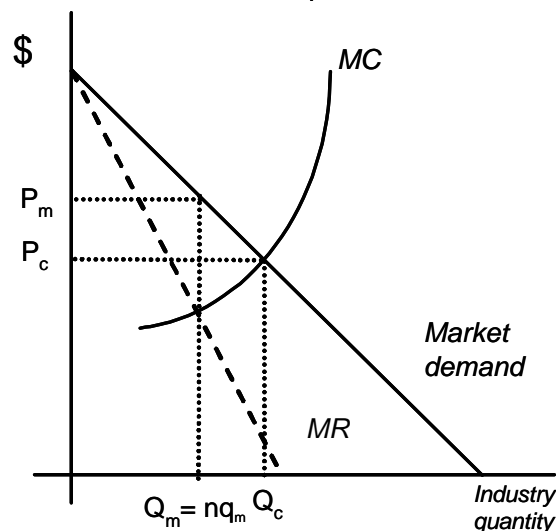
the impact of the cartel on consumer prices. Section 5 contains the results obtained of the empirical part, and the last section emphasizes the main findings and conclusions of the study.

2. Economic rationale of cartels prosecution

a) Rationale for the formation of cartels

By coordinating activities, firms forming a cartel can reduce the output of the industry, raising the prices of the good, and thus, increasing the individual and collective benefits for all the firms involved. This is different from a competitive market; in which each firm make their decisions independently, just considering their own benefits and ignoring the benefits from a reduction in the total market output. Figure 1 shows the difference on prices between a situation with perfect competition and with a cartel.

Figure 1: Impact of a cartel on prices



In this figure, Q_c and P_c are the output level and prices of the industry under competition -firms are price takers and act independently-. On the other hand, Q_m and P_m are the output level and prices of the industry when there is a cartel. At Q_c the cartel's marginal cost is higher than the marginal revenue, thus it is beneficial for the cartel to reduce the output level of the industry until the point where the marginal revenue equals the marginal costs - Q_m -. That is the main rationale of a cartel: it

solves the problem of collective action, making firms to be aware of the benefits they gain by acting together, as a monopolist. At that level, the output of the industry $-Q_m-$ will be divided by the number of firms participating in the cartel $-n^{-1}$.

This basic framework highlights the main objective of cartel prosecution: by breaking the cartel, consumers will be benefited with a subsequent reduction on consumers' prices. The damage caused to the competition process and thus to consumers, as a result of a cartel is straightforward. Indeed, that is the reason why anti-cartel law is usually one of the first antitrust measures adopted by authorities in different countries². According to Viscusi Vernon y Harrington, when a practice has no beneficial but harmful effects, *the "inherent nature of the practice is injuriously restraining trade*. Price-fixing fits into this category and that is why it is considered *per se* illegal in some countries –for instance, in the United States-³: the conduct needs only to be proved and there is no allowable defense.

b) Conditions required for having a successful cartel

Not all cartels are successful in their objective of reducing output and increasing prices. Indeed, there are cases in which some firms within the industry do not join the cartel or firms that join the cartel but end up cheating and not following its rules. In any case, the impact on prices as a result of a cartel will depend on firms' cooperation; if they do not cooperate, then cartels will have little effect on prices.

The main factors necessary to establish a successful cartel are the following:

- a) The cartel must be able to raise the price without inducing substantial increased competition from non-member firms. That requires an inelastic demand and entry barriers to the market. The

¹ The way in which these profits are divided is not necessarily symmetrical. It will depend on the size of the firms and the way in which the cartel is organized.

² Prosecution of Hard Core Cartels –HCC- is the only particular antitrust measure that has been explicitly addressed within the discussion on the multilateral framework on competition policy at the WTO. According to OECD, HCC are defined as anticompetitive agreements, practices or arrangements to fix prices, make rigged bids, establish quotas, divide markets, allocating customers, suppliers, territories, or lines of commerce. <http://www1.oecd.org/daf/clp/Recommendations/Rec9com.htm>

³ Viscusi , Vernon y Harrington. *Economics of Regulation and Antitrust*. MIT Press. Cambridge, Massachusetts. 1995

more inelastic the demand curve is, the higher the price the cartel can set and the greater its profits. High barriers to entry make less likely the entry of potential competitors. In the case of the “live” chicken market in Peru, as will be explained in the next sections, these 2 conditions were met.

- b) The expected punishment for forming a cartel must be low relative to the expected gains. If the probabilities of being sanctioned by the government are high, the cartel may not be formed since large expected penalties reduce the expected value of forming a cartel.
- c) The enforcement cost of the agreement must be low relative to the expected gains. The most complicated the negotiations required to establish the cartel, the greater the cost of creating it. Thus, the formation of a cartel is facilitated when few firms are involved, when they are homogenous, when the industry is highly concentrated, when the product is identical, and when there is a trade association. This enforcement cost of the agreement also includes the possibility to control members' behavior so as to avoid cheating.
- d) Finally, other factors such as idiosyncratic and history dependant-determinants also influence the success of a cartel. For instance, in the case of the cartel in the Peruvian poultry market, this was a factor considered for the determination of the fines imposed to the producers involved.

It is difficult to assign weights to the relative importance of each of the factors and variables mentioned before. In any case, all these different variables and factors are interdependent one of the other and the level of success of a cartel will depend on the combination of all and or some of them.

However, cheating is one of the important factors affecting the success of the cartel: when there are firms within the industry that do not join the market or who do not follow the cartel's rules, consumers are benefited because the violators of the cartel produce more than what the cartel wants, which lowers the market price. As the number of non-cartel firms rises, the price to consumers falls.

This fact can be observed through the evolution of the Lerner Index or price mark-up; $(p-MC)/p$ in a determined industry with a cartel. As the industry moves to a competitive situation -increase of non-cartels firms-, the mark-up goes down until reaching 0 in the competitive equilibrium. Cheating a cartel pays because at every output level, cheaters will earn more than the cartel members: they may produce more and sell at the same price.

c) Empirical evidence on the impact of cartel enforcement

Although there are different studies that deal with the characteristics and impact of cartels, it is difficult to make generalizations about cartel behavior. For example, Levenstein and Suslow (2002), based on empirical evidence, concluded that cartels are both; short-lived and long-lived. Also, they found that there is an enormous variance in the level of cartels' success –their ability to raise prices to the joint-profit maximizing level⁴. Regarding cartel breakdowns, they found that cheating is a common cause. In any case, they point out that the old assumption that highly concentrated industries⁵ are more likely to engage in cartelization practices seems to be the only one that holds true across all the different studies done.

The following sub-sections summarize the main findings of the empirical work done so far on this subject.

Profitability of cartels

In an earlier study, Asch and Seneca (1975) found that collusive firms are less profitable than non-colluders. They pointed out 3 different possibilities to explain this negative relationship between cartel and profits. One of them –the one related to the role of the antitrust prosecution- suggests that unfavorable profits performances may induce collusive agreements, which then proceed under conditions that are discouraging to their success, and thus, they are more likely to be prosecuted. In this sense, they concluded that antitrust enforcement might have been focused on unsuccessful cases and to this extent, this bias of the antitrust enforcement may reduce the economic impact of legal restrictions on collusion.

Eckbo (1976) and Griffin (1989) also studied the profitability of cartels. On the one hand, using international cartel data of 51 agreements in 18 industries, Eckbo found that about the 30% of the agreements analyzed -19 of the 51 cartel agreements- were able to raise price 200% above the unit cost of production and distribution.

⁴ They found that the reported price increases range from 10% to 100% with a median of 25%, for 15 of the 35 cartels sampled.

⁵ In their sample of cartels analyzed, they found that the median market concentration, ranging from 2 to 10 firm concentration ratio, was 83%.

On the other hand, Griffin found that the average Lerner Index for the 54 cartel in his sample was 0.31. The highest Lerner Index he estimated was for the rubber cartel -0.80- whereas the lowest was for the wheat cartel -0.12-.

Deterrent effects of antitrust enforcement

Regarding the deterrent effects of antitrust enforcement, by examining the stock price reactions to federal indictments, Bosch and Eckard (1991) estimated the profitability of cartels, finding that part of the loss observed in the equity shares responded to legal costs, but also to the expected lost monopoly profits from conspiracy. This implies that, if profits from price fixing exceed the expected fines, then the deterrent effect of the antitrust enforcement mechanism could be irrelevant. However, even with this small impact, by breaking up cartels and eliminating future monopoly pricing, antitrust enforcement produces non-insignificant consumer benefits.

Impact of cartel prosecution on prices

Regarding the impact on prices, Block, Nold and Sidak (1981) found that a cartel's optimal price is likely to be an intermediate price –between the competitive price and the price that would have been established in the absence of antitrust enforcement- that depends on the levels of antitrust efforts and penalties. They used a model of collusive pricing in the presence of antitrust enforcement, finding that increasing antitrust enforcement with credible sanctions had the deterrent effect of reducing mark-ups in the bread industry. However, these empirical results were questioned by Newmark (1988), who considered that most of the regional and deterrent effects of antitrust activity were explained by changes in grocery retailer's pricing decisions and in a proxy for private label market share. In this sense, the significance of these deterrent effects was relative since it relied on observations affected by this measurement problem⁶.

Sproul (1993) examined the effects of antitrust activity on prices during the years 1973 and 1984. Through a forecast of how prices would have been without the presence of antitrust activity in the case of 25 cartels prosecuted between 1973 and 1984, he found an increase of 7% in prices over the 4 years following the indictment. The evidence for those cases filed after 1976 –after antitrust

penalties were increased- shows that prices go down at the beginning but then they rise about 17 months after the indictment. He also found a negative correlation between the severity of the penalties and prices.

Also, other studies have important findings with respect to the impact of antitrust enforcement on future pricing. Feinberg (1980), using a model to explain the Lerner Index per firm, found that antitrust indictments against firms have a significant deterrent impact on deviations of price from cost: the Lerner Index decreased by more than 2%. Also, they found that, although weak, there is evidence that indictments against other firms in the industry discipline to some extent the pricing behavior of firms.

On the other hand, Choi and Philippatos (1983), using financial data of 65 indicted firms and 65 matched control firms; found that antitrust enforcement has been effective in restraining the future pricing of the prosecuted firms. This deterrent effect was stronger in the case of firms without cartel experience. However, they also found out that strategic decisions such as growth and financial leverage were not affected by the antitrust enforcement.

Impact of international cartels

In the last years, the impact of international cartels has also been studied. Using a sample of 40 cartels prosecuted by the United States and the European Union in the 1990's, Evenett, Levenstein and Suslow (2001) found that 24 of them lasted at least 4 years. The annual worldwide turnover in the affected products for 20 of these cartels exceeded US\$30 billion. Since national competition policies focus only on the harm done in domestic markets; they pointed out the aspects of cartel enforcement that need a reform in order to improve its impact on markets: a) the patchwork of bilateral cooperation agreements on collection and sharing of evidence, b) penalties based only on national assessments; and c) post-punishment vigilance of the market.

In a study related to the impact of the international cartel on the vitamins market, Evenett & Clarke (2002) found that the prices established by the vitamins cartel in countries without active cartel enforcement regimes were higher than in those with an active regime. This is shown by the data

⁶ This measurement problem was related to the fact that i) the prices used changed quality over the sample

available of exports from countries where cartels' members had their headquarters to Asian, Western European and Latin American countries without an active cartel enforcement regime. In 7 out of 9 economies considered in their sample, the presence of an active cartel enforcement regime induced a reduction in the overcharges by the cartel. In these cases, this reduction was large enough to justify a large proportion of the total cost of competition policy enforcement.

Through a study combining trade data with a sample of US and European prosecutions of international cartels in the 1990's, Levenstein, Suslow and Oswald (2003) quantified the effects of international cartels on developing countries, considering these latter ones either as competitors or co-conspirators or as consumers. They found out that in 1997, developing countries imported US\$54.7 billion of goods from a sub-sample of 19 industries with previous cartel experience during the 1990's. These imports were 5.2% of the total imports and 1.2% of the GDP in developing countries.

To sum up, the impact of cartel enforcement has been widely analyzed by different authors who have used different methodologies to assess this impact. Although there are findings with very important implications from a policy-making point of view, it is important to point out that there are many variables to take into account when cartels are analyzed, and although there might be some stylized facts within the different cartels, the particularities of each case affect considerably the outcomes of the analysis.

3. Cartel enforcement in Peru: Price fixing in the Peruvian live poultry market

3.1 Legal framework for cartel prosecution in Peru⁷

a) Objective and scope of application of the Peruvian Antitrust Law

period, ii) the bread mark-ups were sensitive to the pricing decisions made by grocery retailers.

⁷ FTAA. Inventory of Domestic Laws and Regulations relating to Competition Policy in the Western Hemisphere. <http://www.ftaa-alca.org/ngroups/NGCP/Publications/cpinf03r2e1.asp>

Competition policy in Peru is mainly implemented through the enforcement of the Legislative Decree 701. The objective of this law is to eliminate monopolistic practices, controls, and restraints on free competition in the production, distribution and sales of goods and in the provision of services.

This law is applicable to all persons and entities under public or private law that undertake economic activities. It is also applicable to all persons who direct or represent corporations, institutions, or entities when they take part in the acts or practices prohibited by this law.

According to the provisions contained in this law, acts or behavior involving economic activities that constitute abuse of a dominant market position or limit, restrain, or distort free competition in a manner that injures the common economic interest in national territory are prohibited and shall be punished.

On the one hand, the practices considered an abuse of a dominant position -Article 5- are:

- a) unjustified refusal to satisfy a demand for purchase or acquisition of goods or services, or an offer of sale or provision thereof;
- b) application, in business practices, of unequal conditions to equivalent services, which place some competitors at a disadvantage with respect to others. Granting discounts or bonuses common in generally accepted business practice, such as those for prepayment, amount, volume, or others granted generally, is not considered an abuse of a dominant position in all cases where conditions are equal;
- c) making contracts contingent upon acceptance of supplementary payments that by their nature or in accordance with business custom are not related to the purpose of such contracts;
- d) other cases of a similar nature.

On the other hand, the practices considered anticompetitive -Article 6- are:

- a) ***direct or indirect collusion among competitors to fix prices or other terms of trade or service;***
(emphasis added)
- b) division of the market or supply sources;
- c) application of production quotas;
- d) agreement on product quality when it does not relate to national or international technical standards and negatively affects the consumer;

- e) application in business practices of discriminatory terms for similar services, which place some competitors at a disadvantage with respect to others. Again, granting discounts or bonuses common in generally accepted business practice, such as those for prepayment, amount, volume, or others granted generally, is not considered an abuse of a dominant position in all cases where conditions are equal;
- f) making contracts contingent upon acceptance of supplementary payments that by their nature or in accordance with business custom are not related to the purpose of such contracts;
- g) unjustified refusal to satisfy a demand for purchase or acquisition of goods or services, or an offer of sale or provision thereof;
- h) collusion to limit or control the production, technical development, or investment;
- i) establishment of, agreement on, or coordination of bids or lack of bids in public auctions, competitions, and sales;
- j) other cases of a similar nature.

According to this last article, any practice that has as an objective to fix prices is prohibited. Until June of this year, the development of this type of practices, with a direct or indirect impact on prices or on production, distribution, information about prices and costs was considered *per se* illegal. Thus, the investigation of these practices used to require mainly proofs of the existence of agreements between producers aiming at restraining competition, independently of the effect they might have on the sector involved or on the economy in general. Example of these proofs were exceptional meetings among competitors, subsequent documentation evidencing compliance with the agreed conditions, implementation of policies developed by a trade union bringing together the competitors, etc. The fact that different competitors acted in the same way at the same time –price parallelism- was not itself sufficient evidence of collusion, it could respond to a “leader-follower” strategy -companies following the actions taken by the firm recognized as a leader in the market-.

However, in a recent Decision⁸, the antitrust chamber of the Tribunal for the Defense of Competition of Indecopi issued ⁹ a Precedence of Obligatory Observance establishing that the

⁸ Antitrust chamber of the Tribunal for the Defense of Competition of Indecopi. Resolution N 0224-2003/TDC-INDECOPI. June 2003.

⁹ Although this exceeds the scope of this study, the author is of the view that this change in the way of implementing the law does not contribute to improve the implementation of competition policy in Peru. On the contrary, although there is a long debate in the literature regarding the positive impacts of cartels, as it will be seen in this study, the empirical evidence mainly shows that cartels are formed with the objective of

analysis of cartels should be done following the *rule of reason* approach. According to this precedent, the law should be interpreted in a positive way. In that sense, all cartels should be prohibited; however, cartels with positive effects offsetting the damage caused to consumers and to the competition process would be exempted of sanction. The requisites to be exempted are: a) the conduct observed contributes to the improvement of the production or distribution of products, or encourages the economic and technical progress, providing consumers with an equitable participation in the benefits obtained as a result of the cartel; b) the conduct observed is the only mechanism available to reach the beneficial objectives pursued; and c) the conduct observed do not become an indirect way to facilitate the elimination of competition in a substantial part of the market in which the colluders operate.

In the case of the abuse of a dominant position, the analysis is also conducted under the *rule of reason* approach. This means that, in order to sanction these practices, it is necessary to prove that they damage the general economic interest.

b) Enforcement authorities

The Free Competition Commission –FCC- is the technical and administrative agency responsible for ensuring compliance with the Legislative Decree 701 -Article 8-. It is an autonomous body within the organizational structure of Indecopi –the National Institute for the Defense of Competition and Protection of Intellectual Property. The FCC has a Technical Secretariat that serves as a liaison with the administrative structure of Indecopi. The main duties and powers of the Secretariat are: a) to issue an opinion on procedures related to violations of Legislative Decree 701; b) to conduct investigations on its own initiative or upon request of a private party in order to determine whether prohibited practices are taking place; c) to carry out studies and publish reports; and (d) to prepare draft regulations and adopt directives.

On the other hand, the antitrust chamber of the Tribunal for the Defense of Competition of Indecopi is the second and final administrative instance with jurisdiction in cases involving violations of

raising prices causing losses to the economy. In addition, the way in which this amendment has been written allows the authority to have a considerable discretion, which opens the door to the possibility of using this ruling with political purposes. The efforts should be aimed at making rules more transparent and predictable, not the other way around.

Decree 701. This chamber hears first appeals against decisions of the FCC, rules on competition disputes between the functional areas of Indecopi, recommends to the Chair of Indecopi the necessary steps required to be taken in order to adopt the legal or regulatory measures needed to guarantee free competition, and has recourse to the forces of law and order to execute its decisions.

c) The procedure

The procedure involving violations of the Legislative Decree 701 may be initiated on own initiative of the Technical Secretariat or at the request of a private party. In both cases, if there are reasonable signs of violation of Legislative Decree 701, the party presumed responsible for the investigated actions is notified and informed about the facts attributed to it. Replies to the charges must be submitted within 15 working days, including the relevant evidence. Other parties, with a legitimate interest, are allowed to become a party to the proceedings during this period.

Within the reply period, there might be a settlement if the accused party or parties commit themselves to cease or to modify the allegedly anticompetitive practice. This proposal is subject to the evaluation of the Secretariat and to the approval or rejection of the FCC.

After the reply period expires, there is an evidentiary period that lasts 30 working days. After expiration of this period, the Technical Secretariat submits a report with the results of the investigation and suggests the measures and sanctions to be adopted. Then, the FCC has 5 working days to issue its Decision. These Decisions can be appealed to the antitrust chamber of the Tribunal for the Defense of Competition of Indecopi. The rulings of the Tribunal can be challenged judicially before the Civil Division of the Supreme Court of Justice. This Division's decision can in turn be appealed to the Constitutional and Social Law Division of the Supreme Court.

d) Fines

Fines for violations of the Decree 701 can go up to 1 000 UITs¹⁰ in case the violation is determined to be light or serious; and can be greater than 1 000 UITs in case the violation is determined to be very serious. In both cases, these limits can be reached provided that the fine does not exceed 10

¹⁰ Tax Unit. 1 UIT equals US\$890 under the current legislation.

percent of the gross sales or income of the accused firm in the immediate fiscal year previous to the Commission's Decision.

In addition to the penalty that the Commission may apply to a firm in violation, its legal representatives or directors may be fined up as well, to 100 UITs. This happens when they are found liable for the violations committed.

The degree of severity of the violation and corresponding fine will be determined taking into account the following: a) the type and scope of the anticompetitive practice; b) the size of the market involved; c) the market share of the firm; d) the effect of the anticompetitive practice on current and potential competitors, other parties in the economic process, and users and consumers; e) the duration of the restriction on competition; f) the recurrence to a forbidden conduct -Article 23-.

3.2 The live poultry market in Peru

The relevance of analyzing the impact of cartel enforcement in this particular case relies on the economic importance of this industry: the main products in this industry -chicken meat and eggs- are a very important component of the bundle of consumption of the Peruvian consumer¹¹. Indeed, this sector provides 70% of the animal proteins consumed by Peruvians¹².

In order to have a general understanding of the functioning of this market, in the following section a description of the main characteristics and evolution of the poultry industry will be developed.

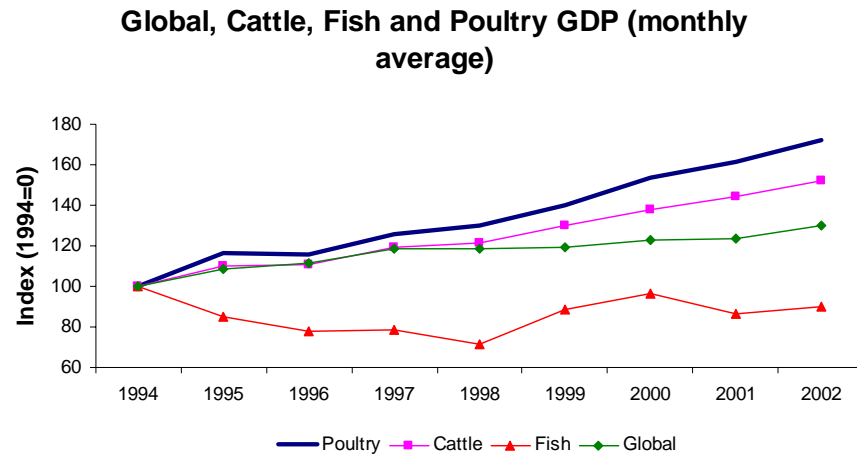
a) Production

The production of chicken meat has constantly increased during the last 9 years. Indeed, Figure 2 shows that, on average, the GDP of chicken meat has increased at a higher rate -7% - than the Global, Fish and Cattle GDP -3%, -1% and 5% respectively-.

¹¹ According to the structure of the bundle of consumption for 1993 and 1994 –previous years to the cartel- in Lima, chicken meat was the product with the highest weight within the classification “food and drinks”. Source: INEI.

¹² Ministry of Agriculture. Realidad del sector pecuario. Aves. (*Current situation of the cattle sector. Poultry*) http://www.portalagrario.gob.pe/pec_real.shtml

Figure 2



Source: INEI¹³ and BCRP¹⁴

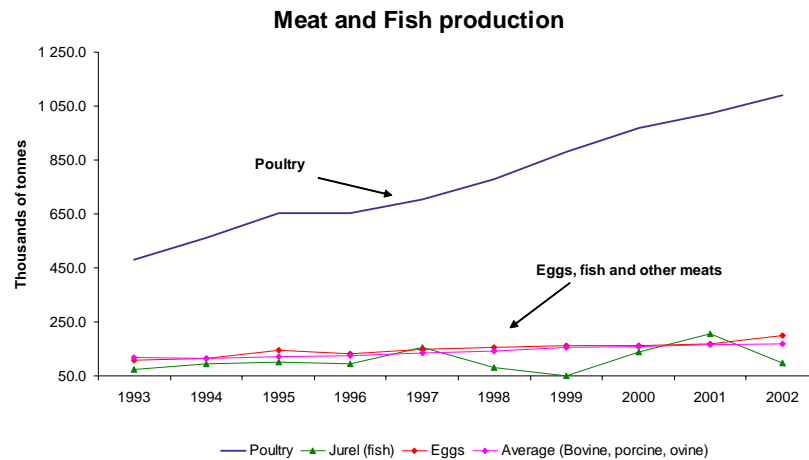
In comparison to other types of meat and fish, Figure 3 shows that in the last 10 years, the production of chicken meat has increased at a much higher rate than the others. This increase in the production of chicken meat has been caused by a larger supply, the weather advantages of the Peruvian coast which facilitates the production of chicken meat, the permanent increase in the per-capita consumption, the increase in the productivity due to a use of better technology and the lower costs in comparison to other types of meat such as beef and pork¹⁵.

Figure 3

¹³ National Institute of Statistics and Informatics

¹⁴ Central Reserve Bank of Peru

¹⁵ APOYO Consultoría. Factores determinantes de la competitividad del sector avícola formal en el Perú (*Determinant factors of the competitiveness of the poultry formal sector in Peru*). Octubre, 1996. p 8
Ministry of Agriculture. Realidad del sector pecuario. Aves. (*Current reality of the cattle sector. Poultry*)
http://www.portalagrario.gob.pe/pec_real.shtml



Source: BCRP

The favorable weather conditions in the Peruvian coast are a relevant factor that explains the increase in the production of chicken meat. Indeed, this favorable weather constitutes a comparative advantage within the Andean region. The fact that in the Peruvian coast there is an absence of rains and an abundance of arid lands facilitates enormously the intensive raising of chickens¹⁶.

According to a study made by the Peruvian Ministry of Agriculture, the production of chicken meat is expected to continue growing in 4% -average- each year between 2001 and 2005¹⁷.

b) Distribution and sales

The chicken meat in the Peruvian market is mainly distributed and sold as the so called “live chicken”. This is the main particularity of the Peruvian market; Peruvian consumers prefer to consume chicken meat recently slaughtered by the seller. The chicken is also sold as frozen chicken –“slaughtered chicken”–. However, the refrigerated or frozen chicken is not highly consumed mainly because of the consumers’ habits and also because there is not enough infrastructure to commercialize the chicken in these conditions at low cost¹⁸. These sub-markets within the poultry industry have different segments of the demand and different distribution channels. Although there is no recent information available, previous estimates suggest that 80% of the sales are of “live chicken” whereas only the remaining 20% are slaughtered chicken¹⁹.

¹⁶ APOYO Consultoría. Op. cit. p 27

¹⁷ Ministry of Agriculture. Cadena productiva del maiz: Conclusiones y recomendaciones. (*Corn productive chain: Conclusions and recommendations*). http://www.portalagrario.gob.pe/dgpa_maiz_conc.shtml

¹⁸ APOYO Consultoría. Op. cit. p 31

¹⁹ Indecopi. Technical Secretariat of the Free Competition Commission. Report 001-97.

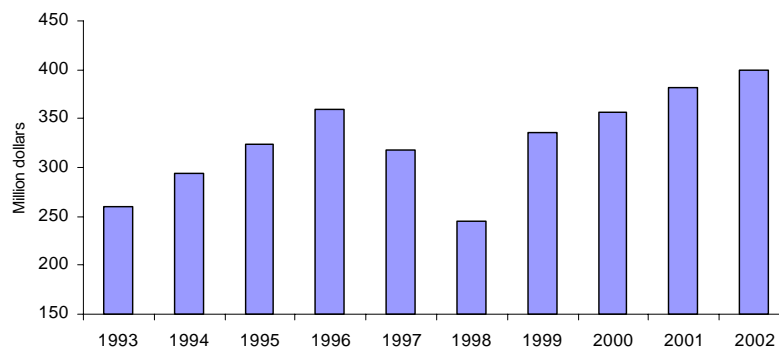
The distribution and sales of the “live chicken” is more complicated from a logistic perspective. It demands the commercialization of the chicken alive until the last selling point, increasing the costs: feeding, losses, sanitary measures, transport, etc. In this segment of the market, there is no foreign competition due to the high importation costs that this would imply.

Regarding the geographical location of the market, it is important to point out that most of the sales in this market are located in Lima and Callao²⁰. According to the Ministry of Agriculture, 65% of the total production of chicken meat in Peru is sold in Lima and Callao.

Finally, regarding the size of the market, Figure 4 shows that the market has grown 6% each year since 1999, reaching its higher value in 2002 -400 million dollars-.

Figure 4

Chicken sales



Source: Ministry of Agriculture and INEI

c) Prices

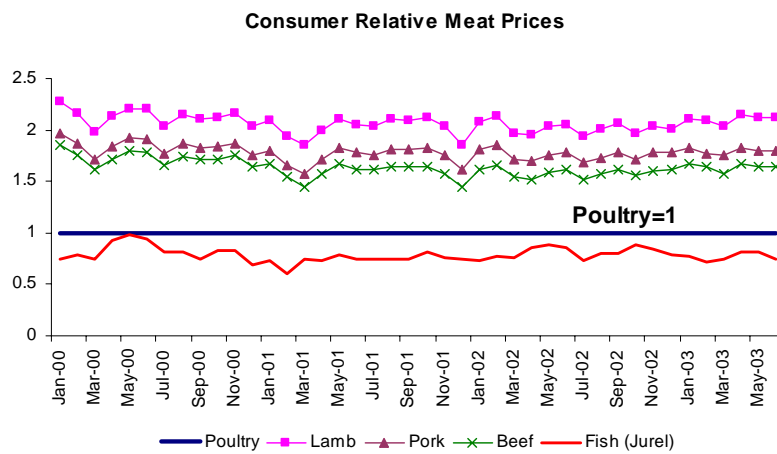
The price of the chicken meat is a very important variable for the economy. During the years 2000 and 2001, the expenses on poultry have represented about 7.2% of the total expenses in food and drinks of the Peruvian consumers²¹.

²⁰ Poultry Producers Association. http://www.apavic.com/html/sections/cuadros/cuadro_10.asp and http://www.apavic.com/html/sections/cuadros/cuadro_8.asp

²¹ National Institute of Statistics and Informatics - INEI. Condiciones de vida en el Perú: Evolución 1997 – 2001. (*Living conditions in Peru: Evolution 1997 – 2001*). <http://www.inei.gob.pe/biblioinei.htm> p 370

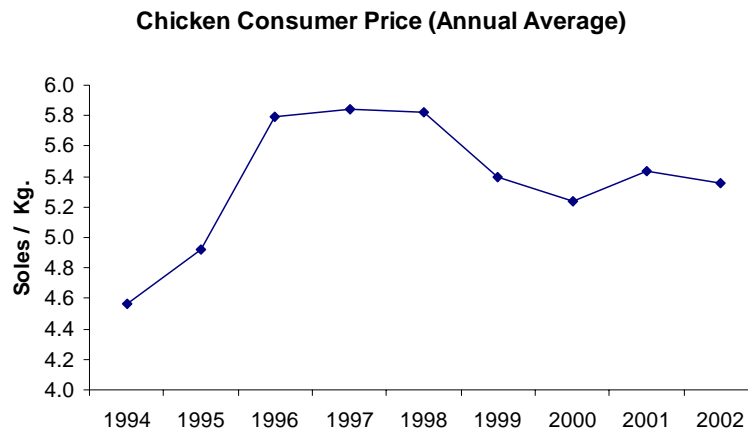
In comparison to other meats, the price of chicken meat is much lower than the price of lamb –lamb price is on average 106% higher -, pork -79% higher on average- and beef -64% higher on average-. However, in comparison to the price of fish –jurel-, the price of the chicken is 28% higher on average during the period observed in Figure 5. This situation seems to be constant during the past decade.

Figure 5



Regarding the evolution of the price of chicken meat, as may be seen in the following figure, during the last years, the price of the chicken meat has been decreasing. Although from 1994 until 1997 prices increased considerably –between 1995 and 1996, the period of the cartel, prices increased 18% on average-; since 1998, the prices of chicken meat have decreased 2% on average each year.

Figure 6



Source: INEI

d) Costs of production

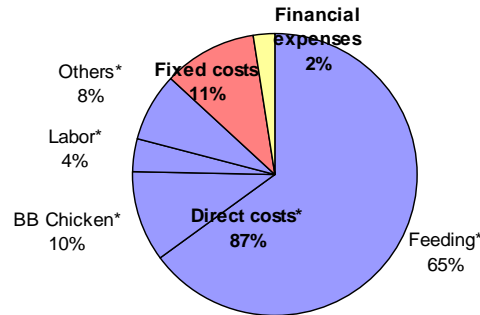
According to the cost's structure of the "live" chicken presented in the Figure 7, the main component of the total cost is the direct –variable- cost -87%-. Within the direct costs, the costs of feeding the chickens constitute the main component -65%-²². The main products used to feed the chicken are ground yellow corn –GYC- and soybean meal. The BB Chicken are provided by the own producers, who also have reproductive and incubation plants.

Fixed costs represent a lower proportion of the total costs -11%-. They are mainly composed by the administrative and sales expenses and the equipment and plants depreciation.

Figure 7

²² Ministry of Agriculture. Cadena Productiva del Maiz. Analisis de la Oferta a Nivel Nacional. (*Corn productive chain. Analysis of the national supply*): http://www.portalagrario.gob.pe/dgpa_maiz.shtml

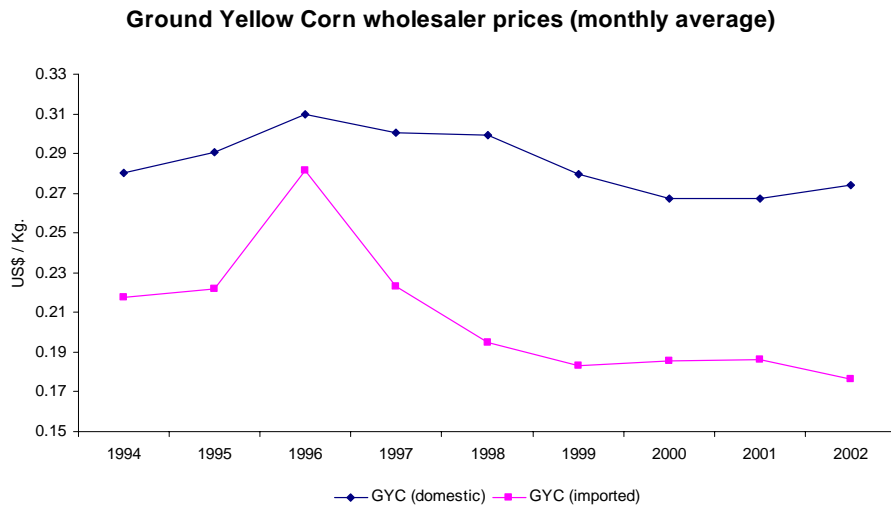
Live Chicken: Cost Structure (per Kg.)



Source: Ministry of Agriculture

Costs may be expected to be stable, since the prices of the main components –ground yellow corn 38% and soybean meal 23%- are not expected to increase significantly²³. In fact, Figure 8 shows that, since 1999, the prices of the imported and of the domestic GYC have been stable.

Figure 8



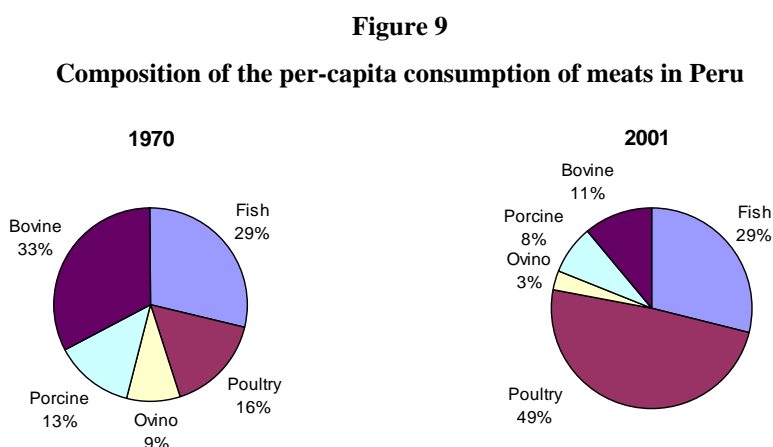
Source: INEI

²³ APOYO Consultoria. Informe de Riesgo Sectorial y Empresa Líderes. (*Sectoral risk and leader enterprises report*). October, 2001

In addition, there are efforts aiming at reducing the costs in the poultry sector, such as the agreement signed between the Peruvian Apiculture Association and the National Committee of Producers of Corn. Through this agreement, both sides aim at stabilizing the purchases and sales of ground yellow corn²⁴.

e) Consumption

Figure 9 shows that the per-capita consumption of chicken has increased considerably between 1970 and 2001²⁵. Within the per-capita consumption of meats in Peru, in 1970, the per capita consumption of chicken meat was only 16% whereas bovine meat was 33%. In 2001, chicken meat explains 49% of the per-capita consumption of meats followed by fish with 29%.



Source: Ministry of Agriculture

During 2001, the consumption of chicken meat was 22.4 kg per hab. per year. It is followed by bovine meat with 5.35 kg per hab. per year. Although this level of consumption is higher in comparison to the other type of meats, it is still low in comparison to the levels of consumption in other countries in the region such as Argentina, Colombia and Ecuador²⁶.

²⁴ Ministry of Agriculture. Cadena productivas. (*Productive Chains*). http://www.portagrario.gob.pe/pec_cadena.shtml

²⁵ Ministry of Agriculture. Cadena Productiva: Maiz – Analisis de la oferta a nivel nacional. (*Productive Chain: Corn – National supply analysis*). http://www.portagrario.gob.pe/dgpa_maiz_nac.shtml

²⁶ Ministry of Agriculture. Consumo Per-capita de las principales carnes. (*Per-capita consumption of the main meats*). http://www.portagrario.gob.pe/sect_pecuario_consumo.shtml

The main determinants of the demand for “live” chicken meat are the level of income of the population, the price of the chicken meat and the price of the substitute products. According to previous studies²⁷, the price elasticity of demand is -0.75, whereas the income elasticity is 0.60 and the cross elasticity –fish- is 0.15.

Also, the study made by the National Institute of Statistics²⁸ suggests that the demand for chicken and eggs is significantly sensitive to changes in the income of the population. The importance of the income is especially high for the middle and low income level. The low socioeconomic level has the highest income elasticity -0.79-. Regarding cross elasticity, the results suggested that for the low-income level, the cross elasticity of chicken with respect to fish and beef are 0.29 and 0.35 respectively. For the middle-income level, the cross elasticity of chicken with respect to fish is 0.22 –lower than for the low-income level-. For the high-income level, the highest cross elasticity is the one of the chicken with respect to beef, which is 0.51.

Therefore, according to these studies, it seems that the main substitute of chicken is fish which is exempted of the General Sales Tax (IGV). In addition, this product; particularly demanded by the low-income groups has been benefited by governmental policies aiming at increasing its consumption –development of investments to improve the infrastructure-²⁹.

f) Firms operating in the market

The formal segment of the industry is consolidated around 4 firms that represent more than 60% of the market. This implies a slight increase in comparison to the situation during the period of the cartel investigation. Then, the 4 largest firms represented a little less than the 60% of the market at the national level³⁰.

²⁷ Velarde, Julio. *Sobrecostos y Distorsiones Macroeconómicas que enfrenta la industria avícola. (Macroeconomic overcharges and distortions that the poultry industry faces)*. CIUP. 1995.

²⁸ National Institute of Statistics and Informatics - INEI. *Elasticidad de la demanda de los principales bienes y servicios consumidos por las familias de Lima Metropolitana. (Elasticity of demand of the main goods and services consumed by families in Metropolitan Lima)*. 1996.

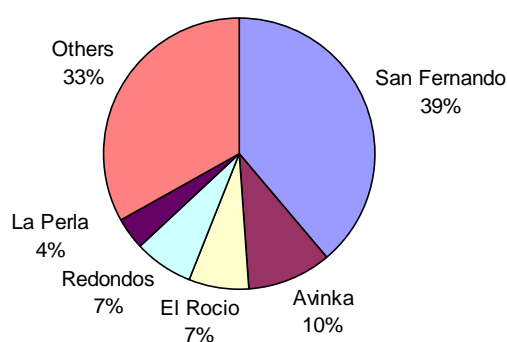
²⁹ APOYO Consultoria. *Informe de Riesgo Sectorial y Empresa Líderes. (Sectoral risk and leader enterprises report)*. October, 2001 p 28

³⁰ These results are obtained by adding the participation of the 4 largest firms presented in Table 3 of the report issued by the Technical Secretariat of the FCC. However, it is important to point out that in the footnote 35 of the same report; the Technical Secretariat presented other results. According to them, the CR4

Some of the firms operating in the industry are integrated in the logistic chain -San Fernando and Redondos-. This integration allows them to absorb the wholesaler margin and can develop market strategies to promote their brands³¹.

Figure 10

Main Producers of "Live Chicken"



Source: Poultry International (1998)

The informal sector, which may represent 25% of the market, is present in both, the production and in the distribution and sales phase. This informal presence is facilitated by the low entry barriers to the market and the facility to obtain the inputs for the production process through informal channels. In the production phase, the informality is facilitated also by the fact that there is no effective sanitary control from the State³².

To sum up, the chicken meat market in Peru is of high importance within the Peruvian economy. Poultry is the component with the highest weight in the bundle of food and drinks of the Peruvian consumer, regardless of the socioeconomic level of the consumer. The production in this market has

was 0.6 until September 1995 and then 0.7 after October 1995. In either way, the market remains concentrated among few firms.

³¹ APOYO Consultoria. Op. cit. p 28

³² APOYO Consultoria. Op. cit. p 27

Apoyo Consultoria. Factores determinantes de la competitividad del sector avícola formal en el Perú (*Determinant factors of the competitiveness of the poultry formal sector in Peru*). October, 1996. p 3

been in permanent growth during the last 10 years, at rates even higher than the ones experienced by the economy in general and especially in comparison to other type of meats and fish.

Since 1999, the market is in expansion, increasing its size in 6%, on average, each year. The price of the chicken meat has decreased since 1998 –after the cartel is broken up- and it is much lower than the price of the other meats. The only product that competes in prices with the chicken meat is the fish –jurel-; however, its level of production is still much lower in comparison to chicken meat. The costs in this market seem to be stable in the following years.

However, regarding the structure of this market, it is important to remark that it remains concentrated among few firms –eventually, even at a higher level than during the period of cartelization-, and given the particular preferences of the Peruvian consumer for the “live” chicken –which creates a natural entry barrier to the market to foreign competition-, it is difficult to count with the disciplinary presence of potential competitors.

All these elements together reflect the importance of this market and the relevance of making sure that its functioning respond to market forces and not to anticompetitive conducts of the agent operating in it.

3.3 The measure

On September 13th, 1996, the FCC started an investigation on price-fixing, volumes control, restraint of trade, and conspiracy to establish entry barriers and development of anti-competitive practices to suppress and eliminate competitors, in the market of live chicken in Lima and Callao, between May 1995 and July 1996. This investigation was a recommendation from its Technical Secretary.

The evidences that supported the presumption of the development of a cartel were the following:

- Different documents proving that poultry producers developed actions to face the problem of overproduction of chickens.
- The producers formed a “Statistics Committee”, in charge of providing alternative solutions to the overproduction problem. These solutions implied concertation within firms: slaughtering

and selling the excess supply of live chicken, slaughtering BB chickens, elimination of fertile eggs and the excess of reproducing hens, export of slaughtered chickens, etc.

- The producers also created a firm in charge of freezing surplus production so as to avoid price decreases.
- Between October and December 1995, the poultry firms continued developing actions that implied concertation: standardization of average weight, allocation of production quotas, joint elimination of surplus.
- Development of price-fixing through output controls -volume and average weight fixing-, for the period January – July 1996, and for the period April-July 1996.
- There was a tradition of collusive conduct in the poultry sector.

a) The investigation:

Although the practice of price-fixing in Peru was considered “*per se*” illegal by the time this investigation was carried out, the FCC’s Technical Secretariat decided to investigate the competition conditions in that market in order to determine whether or not they facilitated the development of anti-competitive conducts. As a result, they found that the formal segment of the market was concentrated among few producers, and that given consumers’ preferences in Peru - consumption of live chicken-, there were natural barriers for foreign competition³³. In their view, these two factors had an influence on the development of a successful cartel.

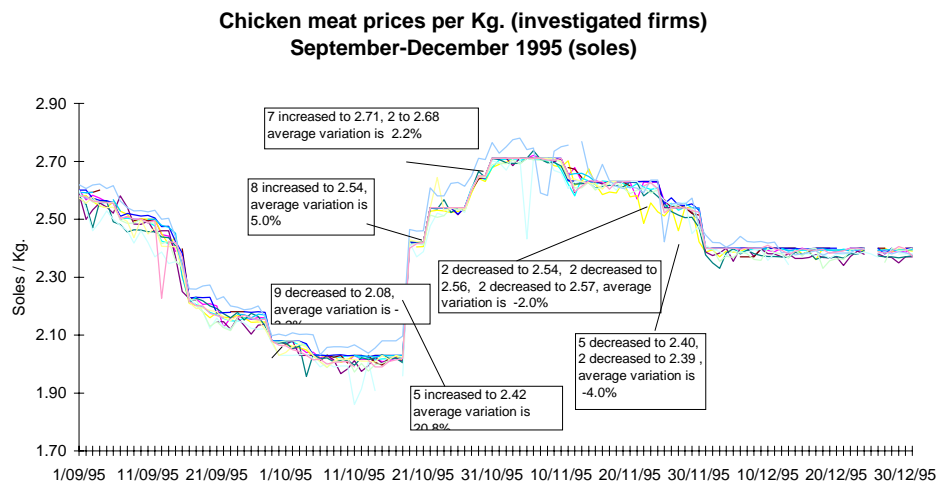
During the investigation, the FCC’s Technical Secretariat found evidences of a parallelism in prices among the producers included in the procedure. During 1995, the supply of live chicken grew substantially due to an excess production whose only effect was to reduce price, while during 1996 there was an important reduction of supply that increased prices.

Figure 11 shows that the prices of chicken meat were severely reduced, starting the last week of August 1995. However, in September 1995, 1188 MT of chicken were driven out of the market,

³³ Given these characteristics –consumers’ preferences for live chicken, high concentration of the commercialization in Lima and Callao, high barriers to foreign competition-, they defined the relevant market from the point of view of the product as live chicken. From a geographically point of view, they considered that the market that should be analyzed was the live chicken market in Lima and Callao.

that volume represented approximately 16.35% of the amount sold through CADA³⁴ during the previous month. During the months of October through December, 570 MT of nationally produced chicken were frozen and placed out of the market, driving the prices up. By the end of October the price of chicken reached its highest level during 1995.

Figure 11



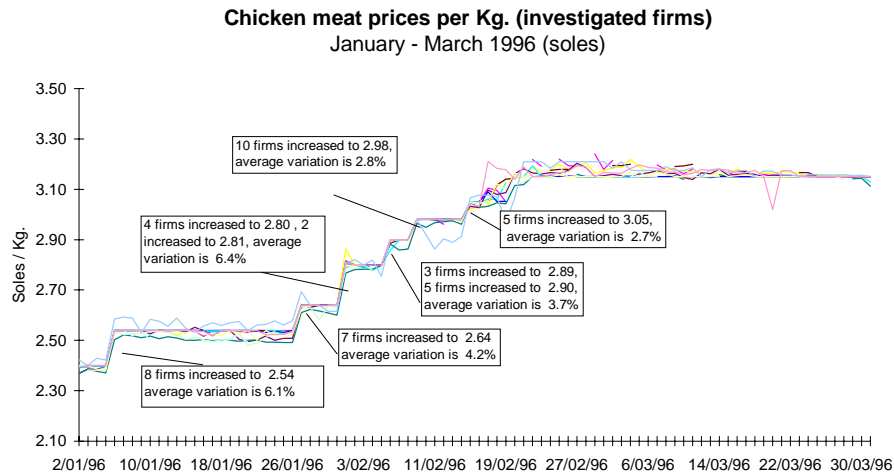
Source: Poultry Breeders Firms. Elaboration: Indecopi.

At the same time, during the months of October and November 1995, the average weight of live chickens traded was reduced from 2.43 Kg. in September to 2.28 Kg. in October and 2.29 Kg. in November. From November to December the market was more stable -the average weight increased and reached the highest level of 1995, 2.44 Kg. per chicken-.

From January to March 1996, prices were more stable, showing a slight increase during February:

Figure 12

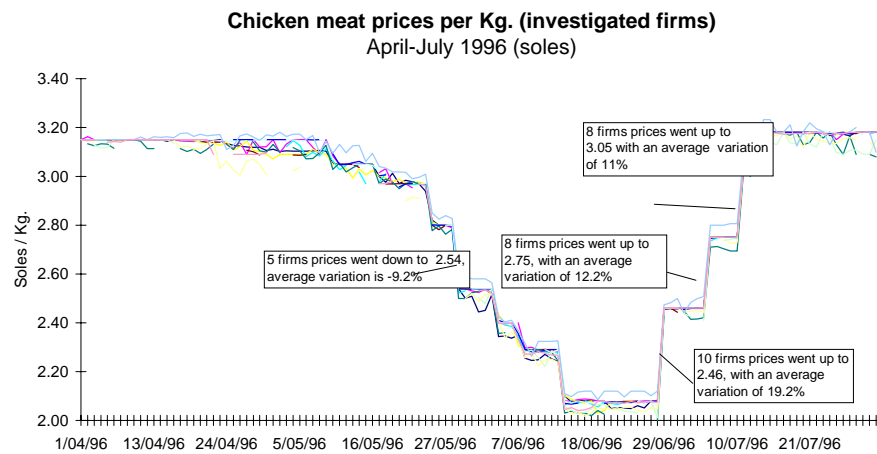
³⁴ CADA –Centro de Abastecimiento y Distribución de Aves- is the most important of the distribution channels where the live chicken is sold from wholesalers to retailers –either formal or informal-.



Source: Poultry Breeders Firms. Elaboration: Indecopi.

During the period between May and June of 1996, prices decreased showing very low dispersion levels within the prices of the different firms.

Figure 13



Source: Poultry Breeders Firms. Elaboration: Indecopi.

In addition, the FCC's Technical Secretariat searched for evidence on agreements aiming at restricting the free competition in the chicken market. The facts found were the following:

- The producers had meetings –at least once every week- in its association headquarters to evaluate the market behavior and to reach an agreement on how to deal with the oversupply observed in the market -1995-.
- In May 1995, chicken meat was frozen in order to avoid a price reduction in Lima and Callao. This project was implemented through an agreement to trade the frozen chicken in the market of the southern zone of the country (Cuzco, Arequipa and Puno). At the same time, the objective with this project was to stop the entry of imported chicken coming from Chile and Bolivia. This implied the creation of entry barriers to potential foreign competitors.
- In July 1995, a program established the schedule and quotas for freezing chicken -160,000 chickens-.
- During May 1996, the firms within the APA³⁵ agreed to reduce the price of chicken temporarily and then increase it later on. The strategy designed inside the APA aimed at encouraging the consumption of chicken meat, eliminating the surplus generated by the decrease in demand and the increase in the levels of breeding observed during March.
- Further evidence found during the process showed clearly the intention of the producers to control market prices.

b) Poultry-Breeders Strategic Alliance -PSA- or Attempt of Poultry-Breeder's Merger -APM-

- In 1995 a group of firms that represented 56% of the live chicken market in Lima and Callao adopted agreements on production, trading, input buying levels, and created the “Poultry-Breeders Strategic Alliance” -PSA-, whose name was modified afterwards to “Attempt of Poultry-Breeder's Merger” –APM-.
- The change in the structures of these firms involved as a result of the merger was not proved during the procedure. What it was proved was that those firms adopted different agreements aimed at coordinating their market behavior, restricting or eliminating competition and imposing entry barriers into the market.
- The mechanisms agreed for that purpose were hoarding the productive capacity of the farms or incubation plants of firms outside the PSA; lobbying with bankers and government authorities

³⁵ APA –Asociación Peruana de Avicultura- means Peruvian Poultry Association.

to limit the access of potential competitors to credit and to establish legal conditions or requirements that will avoid potential entry.

- Although there was a long period of time since negotiations for the merger were initiated, the alleged goal was not reached. Besides, no progress in the tasks required by a merger was demonstrated.
- The Secretariat determined that, since this practice was not proved to be related to a merger process, it should be evaluated under articles 3 and 6 of Decree No. 701, which establish the prohibition of any agreement, decision or practice aiming at or having the effect of, restricting or misguiding the competitors within a specific market.
- Nevertheless, the Tribunal's Resolution concluded that there was not sufficient evidence that the firms involved in the PSA created market entry barriers. In addition, even if some agreement restricting competition was reached within the PSA or APM, it would have been overlapped by the agreements reached within the frame of a bigger conspiracy in the industry. Thus, the Tribunal decided that it had no sense to consider this particular conspiracy as an independent practice to be punished. In any case, the Tribunal was of the view that this practice could have been considered only as an agreement to present a coordinated and stronger position in the main conspiracy negotiations.

c) Case Resolution:

The collusion involving 21 firms for the charges of restricting competition through price-fixing was declared founded by the FCC in January 1997. Although at the beginning, the procedure also included the investigation for fixing volumes and creating entry barriers to the market, the investigation was finally focused in the analysis of price-fixing.

The FCC ordered the firms to stop the anti-competitive practices immediately and sanctioned them with fines set according to the type and scope of competition restriction and to the level of participation of each firm the anti-competitive agreements.

This Decision was partially reconfirmed by the Tribunal in the extent referred to the infringement of Legislative Decree No. 701 for price and volume fixing. However, the Tribunal declared the process unfounded against some of the firms³⁶ and reduced the fines imposed by the FCC.

d) Fines:

The fines were imposed considering the degree of infringement³⁷, and the amounts were not higher than 10% of their sales through CADA -Distribution Centers- between May 1995 and July 1996, as stipulated by the Legislative Decree 701. For economically related firms -in which one or several of them did not participated directly in trading of chickens- fines were calculated on the basis of sales made by the firm that did trade through CADA and were afterwards divided between the economically related firms. Regarding the PSA or APM, a higher fine was applied to the firms involved; the FCC considered that the agreements adopted by them were a major restriction of competition.

The Tribunal agreed with the application of fines depending on the degree of fault of the firm involved. However, they were of the view that the FCC did not took into account that, within the months of May 1995 and April 1996, the law applicable for that time had a lower maximum fine for infringements of the Competition Law -50 UITs-. In this sense, the amount of fines was re-estimated.

This case was appealed in the second and last administrative instance and it went to the Judicial Power. There has been no resolution from the Judicial Power yet; however, just a small part of the fines has been already paid –and just recently in November 2002-. Out of the 2 120 UIT's imposed as fines in the Tribunal's Decision, only 8% of them have been already paid³⁸.

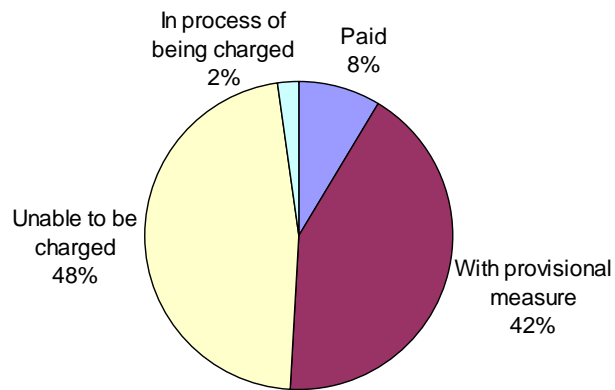
Figure 14

³⁶ The firms were Granjas Reproductoras El Hatillo S.A., y Haidarliz, Granja Los Huertos S.A., Agropecuaria Villavictoria S.A. y Avicola del Norte S.A.

³⁷ The degrees considered were: “important”, “very important”, and “extremely important”.

³⁸ The rest of the fines imposed have not been paid yet because the firms involved are either in bankruptcy or do not exist anymore -48%- or have a provisional measure that allows them to hold the payment of the fine -42%-.

Status of the fines imposed by Indecopi (2003)



Source: Indecopi

This long delay of the Judicial Power to resolve cases is a very dangerous threat that goes in detriment of the effectiveness to achieve the goals pursued by competition policy. It considerably reduces the disciplinary effect on conducts pursued by the enforcement of cartel prosecution.

4. Methodology to assess the impact of the cartel on consumer prices

As shown in the second section, there is a wide variety of empirical research and of methodological approaches used to study the impact of cartels and cartel prosecution. However, the starting point when it comes to the impact analysis of cartels on consumers in particular, is to try to answer relevant questions such as how successful the cartel was in raising the prices; and whether prices rose or fell as a result of the measure. This has to be measured in comparison to how prices would have been in the absence of the cartel and of the antitrust measure.

In this particular case, the econometric strategy used will be based on the selection of a set of predictors of the price of chicken meat, and once the predicted price is obtained, it will be compared with the actual price observed in the market. The main objective is to estimate how the prices of chicken meat in Lima would have been in the absence of the cartel and in the absence of the antitrust measure.

The set of predictors will be goods selected from the demand and from the supply side in order to have a better estimate of the predicted equilibrium price in this market. On the demand side, the set of goods with the highest influence in the bundle of consumption of the Peruvian consumer will be the ones considered as potential predictors. In addition, there are some characteristics that have to be met by this type of predictors. In principle, these predictors have to be unaffected by the conspiracy and by the antitrust measure and have to meet the three following requirements³⁹:

- a) the predictors have to be sold under similar conditions of supply and demand,
- b) the price of the predictors must not be significantly affected by any event affecting the price of the chicken,
- c) before the antitrust measure is taken, the price of the predictors must have a close correlation to the price of the chicken.

Since the third criterion is the one that is easier to measure, it may have a decisive influence on the final decision regarding the set of predictors.

On the supply side, the goods that are substitutes of the chicken meat in the production process and that are related to the costs of producing chicken meat will be considered. These predictors do not have to meet the criteria mentioned before; they will be affected by events affecting the price of chicken.

Once the predictors are selected and considering that the official duration of the cartel was from May 1995 until July 1996, the following regression will be run:

$$\log P^{ch} = \hat{\alpha} + \sum \hat{\beta}^* \log P^{pi}$$

In order words, the price of chicken (P^{ch}) will be run on the price of the different potential predictors (P^{pi}) for the period between January 1990 –oldest observation available- and April 1995 – one month prior to the beginning of the cartel- in order to find the predicted price of chicken. Once the results are obtained -how the price of the chicken meat would have been over the entire period

³⁹ The selection of this predictor or set of predictors is based on the strategy used by Sproul (1993).

in the absence of the cartel and of the antitrust measure-, they will be compared with the actual prices charged by the cartel in order to see how successful the cartel was in raising prices.

The assessment of the impact of cartel prosecution on consumers' prices in particular, should follow the same methodology described previously, but running regressions for the period between May 1995 and July 1996 –the period of the beginning and breaking up of the cartel-. However, given that the information available is on a monthly basis and that the period of cartelization includes only 15 observations; the impact of the antitrust measure will be evaluated using the results obtained in the regression run to evaluate the impact of the cartel on consumer prices.

The data utilized –monthly average prices of the main complements and substitutes of chicken meat- to run the regression was collected from the National Institute of Statistics and Informatics – INEI- and the data related to the import price of the Ground Yellow Corn –GYC- was collected from the Statistical Department of the Peruvian Customs –Aduanas-.

5. Empirical findings

On the demand side, according to surveys of INEI, chicken meat is one of the main components of the bundle of foods and drinks consumed by Peruvians⁴⁰. In fact, according to the structure of the bundle of consumption in 1993 and 1994⁴¹ –period previous to the cartel-, chicken meat is the component with the highest weight within the bundle of foods and drinks. This emphasizes the relevance of enforcing cartel prosecution in this particular market.

Regarding the other products with the highest weights in the bundle of consumption, the survey for the years 1993 and 1994 shows the following:

Table 1

⁴⁰ National Institute of Statistics and Informatics – INEI. Perú: Medición de los Niveles de vida y de Pobreza – ENAHO 1995, ENAHO 1996. (*Peru: Measurement of living and poverty standards – ENAHO 1995, ENAHO 1996*).

<http://www.inei.gob.pe/biblioinei.htm>

⁴¹ Source: National Institute of Statistics and Informatics –INEI.

Product	Weight (%)
Chicken	3.97
Bread	3.69
Beef	2.34
Rice	2.33
Canned milk	2.17
Potatoes	1.54
Sugar	1.38
Beer	1.14
Fresh and frozen fish	1.10
Soft drinks	1.03
Noodles	1.00

After chicken meat, the following products with the highest weight are bread, beef, rice, canned milk, potatoes, sugar, beer, fish, soft drinks and noodles⁴².

On the other hand, according to the methodology presented in the previous section and in order to find an accurate set of predictors of the price of chicken meat, correlation coefficients of the prices of most of these products and the price of the chicken meat were estimated for the period previous to the cartel. This is the third criterion established in the methodology to select the set of predictors.

The results of the correlation coefficients are the following⁴³:

Table 2

⁴² This table shows the 11 products with the highest weight. The whole list of components of the bundle of food and drinks includes up to 79 products.

⁴³ The correlation coefficient of fish is referred to the price of cojinova. The coefficient for the jurel is -0.27 for the same period.

Product	Weight (%)	Correl. Coef with chicken 1/
Beef	2.34	0.79
Rice	2.33	0.56
Sugar	1.38	0.43
Canned milk	2.17	0.40
Bread	3.69	0.36
Fish	1.10	0.18
Noodles	1.00	0.16
Potatoes	1.54	0.04

1/ Period from Aug 1990 to Apr 1995

As seen from the previous table, the products with highest weight in the bundle of consumption are the ones that at the same time show the highest correlation coefficient with respect to the price of chicken meat –excepting sugar which has a high correlation coefficient and is ranked 7th in the bundle of consumption.

Therefore, given all the factors recently mentioned: the importance of these products in the bundle of consumption of Peruvians, the knowledge of consumers' preferences and the correlation coefficients obtained for most of these products; the predictors from the demand side included in the regression were beef, rice, sugar, canned milk and bread⁴⁴.

On the supply side, two other goods were included. On the one hand, eggs were considered as a substitute of chicken meat given that, there are two choices available during the production process: chickens are grown either to produce chicken meat or to produce eggs. On the other hand, the Ground Yellow Corn was also considered given that it is the main component in the production costs –with a direct incidence of 38% in the total cost- and any change in its price affects directly the price of the chicken meat. In addition, it is important to point out that the price considered for the GYC was the import price given that, during the last decade, the imported GYC was the most utilized by the producers in this industry⁴⁵. As mentioned earlier, just since the year 2000 this

⁴⁴ The information regarding the price of beer and soft drinks was not available during the investigation. Regarding fish, noodles and potatoes, given the size of the period -57 observations-, they were excluded because of the low correlation coefficients, even in the case of jurel – -0.27 -.

⁴⁵ APOYO Consultoría. Factores determinantes de la competitividad del sector avícola formal en el Perú (*Determinant factors of the competitiveness of the poultry formal sector in Peru*). October, 1996

situation is changing as a result of an agreement between poultry and GYC producers to stabilize the demand and supply in the GYC market.

The period initially considered for the regression was from January 1990 –oldest observation available- until April 1995 –one month prior to the initiation of the cartel-. However, given that the first half of 1990 included a period of hyperinflation in the Peruvian economy, the period was reduced from August 1990 –when the price consumer index begins to show stability- until April 1995 in order to exclude the effect that this hyperinflation may have had on prices. Therefore, the series of nominal prices available for all the goods included were converted to real prices and then the regression was run in logarithms –ln- of these real prices.

The results obtained were the following:

Table 3

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.85443
R Square	0.73004
Adjusted R Square	0.69148
Standard Error	0.07750
Observations	57

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	7	0.79598	0.11371	18.93005	0.00000
Residual	49	0.29434	0.00601		
Total	56	1.09032			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	-0.39695	0.32894	-1.20675	0.23332	-1.05799	0.26409	-1.05799	0.26409
Rice	0.04045	0.14622	0.27665	0.78321	-0.25340	0.33430	-0.25340	0.33430
Bread	0.24659	0.17717	1.39184	0.17026	-0.10944	0.60263	-0.10944	0.60263
Beef	0.85740	0.12025	7.12983	0.00000	0.61573	1.09906	0.61573	1.09906
Canned milk	-0.07486	0.17644	-0.42429	0.67321	-0.42943	0.27971	-0.42943	0.27971
Eggs	0.23993	0.07437	3.22603	0.00224	0.09047	0.38939	0.09047	0.38939
GYC (import price)	0.14653	0.09004	1.62743	0.11006	-0.03441	0.32748	-0.03441	0.32748
Sugar	-0.38968	0.17580	-2.21655	0.03133	-0.74297	-0.03639	-0.74297	-0.03639

As seen from the econometric results, sugar, beef and eggs are significant – t-Stats higher than 2 in absolute values and significant P-value-. There is 95% of confidence that they are significant to estimate the price of chicken meat. According to the signs of the coefficients –cross elasticities with respect to chicken meat-, the presumption made earlier on the type of correlation with the price of chicken meat is correct: Beef and eggs are positively correlated to the price of chicken. In other words, they are substitutes of the chicken meat. The coefficient for the sugar is negative, which shows complementarity with respect to chicken. The other goods do not show coherent signs in all

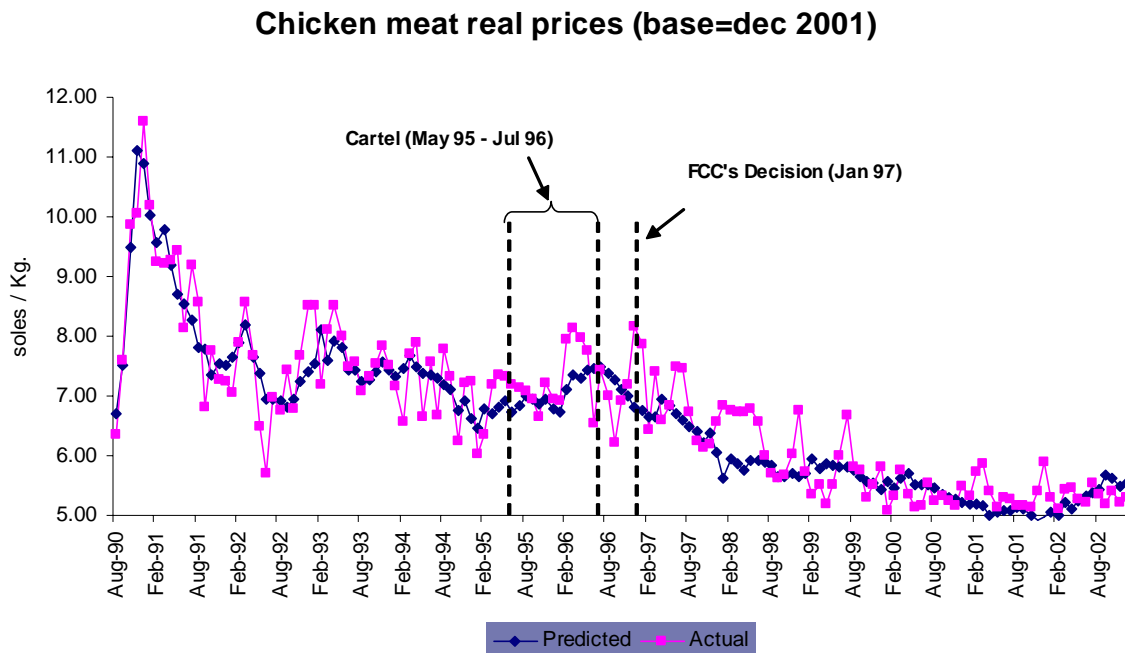
cases –bread and rice should be negative since they are most likely complements of chicken meat-; however, these results are not significant either – t-Stats lower than 2 in absolute values and not significant P-value-. Of all these products, beef is the one with the highest coefficient which shows the high degree of complementarity with chicken meat. Sugar is the next product with the highest coefficient -0.38-, followed by eggs -0.25-.

In addition, the R^2 has a value of 0.73004 which says that this set of predictors explain about 73% of the behavior of the chicken meat price.

Having all these results, the price of chicken meat was predicted and the results are presented in Figure 15.

According to Figure 15, most of the time, during the period of cartelization, the predicted price was lower to the actual price. This means that the cartel allowed its members to charge higher prices.

Figure 15



Source: INEI (actual price)

The predicted prices were on average 3% lower than the actual prices observed in the market. The median of this difference for the same period was 4%. In addition, for the period posterior to the FCC's Decision in which the cartel was sanctioned -January 1997 until December 2002-, on average, the predicted prices were 2% lower than the actual prices. In other words, the difference between the predicted and the actual prices was reduced in 1% after the intervention of Indecopi. At the same time, the median of this difference for the period after breaking up the cartel is 1%: that is 3% lower in comparison to the median during the period of cartelization.

Table 4

	Averag	Media
May 95 - Jul	0.03	0.04
Jan 97 - Dec 02	0.02	0.01

Definitely, this slight reduction in prices might also be explained by other factors such as a reduction in costs, or the disciplinary presence of goods that are substitutes of the chicken meat such as beef and fish⁴⁶. However, the active presence of the competition authority and the past experience of sanctioning this cartel must have had influence in disciplining the conduct of the agents operating in this market.

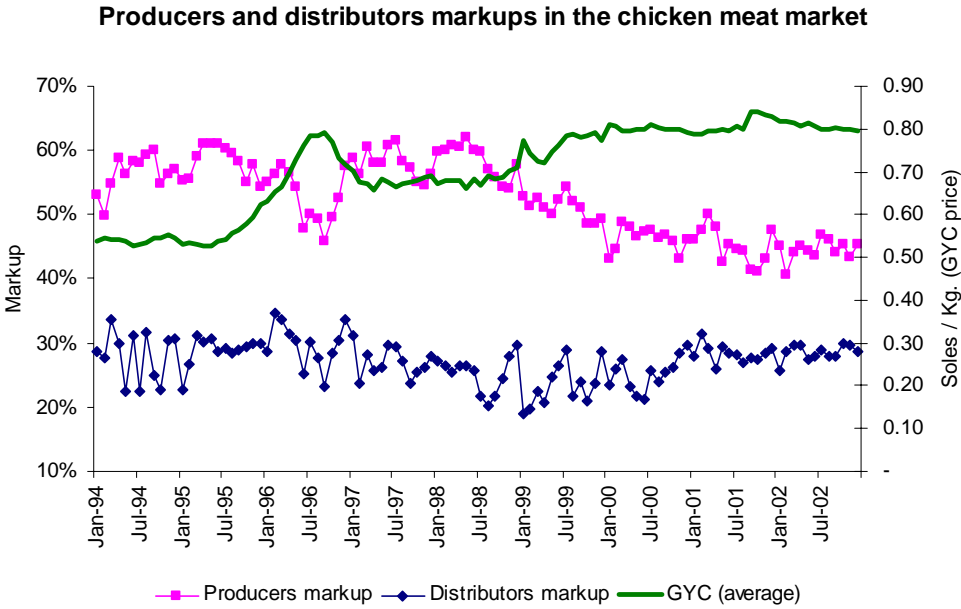
Indeed, observing the evolution of the estimated markups⁴⁷ in this market -Figure 16-, it can be seen that, whereas the distributors' markup has been stable throughout the period analyzed; the producers' markup has been constantly reduced since early 1998. Also, for the same period, the price of the imported GYC has increased. These 2 factors together show that the producers in this market have absorbed this increase in their costs, and have not completely transferred it to the consumers. This could be caused by an increased competition with other substitutes such as fish - which is receiving government's support-, or by the increasing presence of the informal sector - which in the last years is estimated to capture 25% of the market-. However, as pointed out earlier,

⁴⁶ In the case of the fish -jurel and cojinova-, although they seem to be a strong substitute of the chicken meat for the low-income consumers -the vast majority of the Peruvian population-; as pointed out before, the statistical results obtained from the correlation coefficient and the regressions run to select the best set of predictors did not show either a high significance or a coherent sign for these two products with respect to chicken meat.

⁴⁷ These markups have been calculated considering a total cost based built on the assumption that the cost of the GYC represents 38% of the total cost. APOYO Consultoria. Informe de Riesgo Sectorial y Empresa Líderes. (*Sectoral risk and leader enterprises report*). October, 2001.

the disciplinary effect of having a competition agency with an active role in the economy must have had an influence on deterring potential anticompetitive conducts from the agents operating in this market.

Figure 16



Source: INEI and Aduanas

In order to test the robustness of these results, additional regressions with changes in the set of predictors either from the demand and supply side, were run so as to check the variation in the results obtained.

The results of these regressions are presented in Table 5.

Table 5

		Original regression	Robustness test 1	Robustness test 2	Robustness test 3	Robustness test 4	Robustness test 5
Intercept	Coeff.	-0.39695164	-0.64238688	1.88518068	1.791369991	0.04978	0.05282
	T - Stat	-1.20674555	-2.05211514	8.290803267	9.882054202	0.11090	0.11609
Rice	Coeff.	0.04045368	0.042402868	0.369596693	0.437310918	0.11236	0.12001
	T - Stat	0.276654826	0.279316516	2.353245339	2.834894847	0.76872	0.70254
Bread	Coeff.	0.246593181	0.295942405	-0.21852249	-0.04923323	0.20266	0.19283
	T - Stat	1.391838403	1.637474494	-1.38062388	-0.31094602	1.09706	0.88951
Sugar	Coeff.	-0.38967768	-0.36723317			-0.39760	-0.40388
	T - Stat	-2.21654692	-2.00417584			-1.89325	-1.80584
Canned milk	Coeff.	-0.07486156	-0.04226616	0.231016771	0.092992438	-0.02019	-0.02844
	T - Stat	-0.42428661	-0.22729945	1.106462836	0.427204811	-0.11260	-0.13978
Beef	Coeff.	0.857395713	0.86792558			0.70942	0.71000
	T - Stat	7.129827296	6.805072609			4.91270	4.85853
Potatoes	Coeff.			-0.2903484	-0.23059173	-0.17356	-0.17261
	T - Stat			-3.76128424	-3.10340197	-2.56554	-2.49432
Cojinova (fish)	Coeff.			-0.12837049	-0.16532544	-0.03692	-0.03722
	T - Stat			-3.24103748	-4.43282952	-0.88188	-0.87664
Noodles	Coeff.						0.01396
	T - Stat						0.08929
Eggs	Coeff.	0.239929821	0.236674865	0.273635183	0.193381391	0.27624	0.27716
	T - Stat	3.226034824	2.985424303	3.163579607	2.161569872	3.07788	3.03490
GYC (import price)	Coeff.	0.146534272		0.174122516		0.20771	0.21241
	T - Stat	1.627432459		1.417077786		2.01052	1.81607
GYC (domestic price)	Coeff.		0.003526905		0.125346052	0.01583	0.01608
	T - Stat		0.069111583		2.101781335	0.28379	0.28484
R2		0.73004	0.71548	0.60840	0.62607	0.76575	0.76579
Actual-predicted during cartel (average)		3%	4%	6%	9%	2%	2%

In the first regression, the GYC was changed including the domestic price rather than the imported one –changes only on the supply side-. The results are mainly the same than in the first regression in terms of the type of correlation and the significance of the predictors: just beef, sugar and eggs remain significant and they keep the same signs. However, since the domestic price of the GYC is less significant than the imported one, the R^2 goes down to 0.71548, and on average, the difference between the actual and the predicted price goes up to 4%.

In the second regression, the predictors from the demand side are changed: beef and sugar –the predictors with high significance- were replaced by fish and potatoes –the goods that were left out in the first regression-. As a result, rice, potatoes, fish and eggs turned out to be significant; however, the signs of the coefficients of rice and fish suggest a contra intuitive relationship between these products and chicken: the coefficient for rice is positive suggesting it is a substitute of chicken meat rather than a complement. On the other hand, the coefficient for fish is negative, suggesting it is a complement of chicken meat rather than a substitute. In general, it is important to bear in mind that these results are less confident than in the original regression: the R^2 decreases considerably to 0.60840.

The third regression includes the changes made in the two previous regressions but at the same time. The results are very similar to the ones described for the second regression. However, in this case, the coefficient for the domestic price of the GYC becomes significant and with the expected sign –positively correlated to the price of chicken meat-. The R^2 in this case, goes down as well to 0.62607, just a little higher than in the second regression.

Since these results suggest that the original results obtained are more sensitive to changes made on the demand side, a fourth regression was run including this time, all the products originally considered –beef, sugar, rice, canned milk, eggs and imported GYC- and the ones introduced in the three last regressions –potatoes, fish and domestic GYC-. As expected, with a wider variety of predictors, the R^2 goes up to 0.76575 and the products with significance are beef, potatoes, eggs and imported GYC. The signs of the coefficients are the expected ones as well: beef, eggs and imported GYC are positive, suggesting they are substitutes of the GYC; and the coefficient for potatoes is negative which suggest it is a complement of chicken meat, as expected, considering the knowledge of the patterns of consumption of Peruvian consumers. In addition, as expected, with a more accurate set of predictors, the difference between the actual and predicted price goes down to 2%.

In order to confirm these results, a last regression was run including the next variable in the list that was originally left out because of its low correlation coefficient with chicken meat: noodles. As seen in Table 5, the results are very similar to the previous regression: the same products remain significant –excepting for the GYC- and the R^2 slightly increases to 0.76579. Therefore, it seems that beyond this last set of predictors considered in the fourth regression –robustness test 4- the variation in the results is not significant. Indeed, in terms of the difference between the actual and the predicted price, the result does not change in this regression, it remains in 2%.

In addition, it is important to bear in mind that in all the different scenarios, the difference between the predicted and the actual prices indicates that, on average, there was an increase in the prices during the period of cartelization. In that sense, there is consistency in the results showing that the cartel raised the consumer prices.

When these difference between the actual and the predicted prices are estimated –for the cases of 2% and 3%- during the period of cartelization⁴⁸, it is found that the cartel paid between 8.8 and 13.3 million dollars to all its members. Although in comparison to the size of the chicken meat market in Lima and to the amount of money spent by Peruvian consumers on food, these amounts do not represent a high percentage; they do have some relevance from a policy making point of view.

Indeed, in comparison to the costs of running Indecopi -10.2 million dollars in 2002-, enforcing an active cartel prosecution regime that breaks up a cartel that cost to consumers between 8.8 and 13.3 million dollars might be justified. This statement is emphasized if it is considered that, this cost of running Indecopi includes the cost of running not only the antitrust area, but also all the other areas operating within Indecopi: bankruptcy, intellectual property, consumer protection, market access, anti-dumping, technical standards, and unfair competition. If we consider only the costs of running the Free Competition Commission -2% of the total cost of running Indecopi-, the antitrust chamber of the Tribunal for the Defense of Competition -5% of the total cost-, and the administration -11% of the total cost-; it turns out that the costs of running the antitrust area are 1.8 million dollars⁴⁹. In this case, the benefits that enforcing an active cartel prosecution regime brings into the economy, completely pay off the costs of implementing it.

Also, these benefits are underestimated since they only consider the cartel in the poultry market; there have been other markets where agents were involved in collusive practices and were sanctioned. Some of them were also important markets such as the one of wheat flour. In addition, other point to bear in mind is that the percentage of increase in prices could have been higher in case there was not an active antitrust authority.

This implication is relevant to the discussion on the multilateral framework on competition policy at the WTO –and specifically on whether WTO Members should adopt cartel laws- to the extent that

⁴⁸ This estimation has been made considering the sales of chicken meat in kilograms during the period of cartelization. The information on the sales of chicken meat was obtained from the PAA's web site: http://www.apavic.com/html/sections/cuadros/cuadro_8.asp

⁴⁹ The source of this information is Indecopi. This estimate is conservative given that the cost of running the administration of Indecopi and the antitrust chamber include also the cost related to other areas such as consumer protection, bankruptcy, dumping, market access, unfair competition, technical standards, etc.

this case shows that at least in Peru, having an active cartel prosecution regime is justified in terms of the benefits generated by such enforcement⁵⁰.

Indeed, as said before, Clarke and Evenett (2003) arrived to the same conclusion in the case of 7 developing countries: they found that an active cartel prosecution regime has a deterrent effect on cartel's formation and/or their ability to raise prices. Moreover, the reduction in overcharges caused by the presence of an active cartel prosecution regime was large enough to cover an important part of the total cost of implementing such regime⁵¹. In addition, there is evidence on important spillover effects as a result of having an active cartel prosecution regime, especially in the case of international cartels⁵². Having a multilateral framework that promotes or requires WTO Members to enforce cartel prosecution regimes could be justified in terms of the savings that could generate in the economies of many of the WTO Members.

6. Concluding remarks

This study gives an example of how enforcing an active cartel prosecution regime can generate non-trivial benefits to consumers, especially in very sensitive markets like the one studied here. In this particular case, the cartel in the live chicken market in Peru cost between 8.8 and 13.3 million dollars to consumers. This amount is between 5 and 7 times the cost of running the Peruvian antitrust authority.

This fact is relevant considering the discussion on the multilateral framework on competition policy at the WTO. Indeed, this study emphasizes the fact that the overcharges caused as a result of a cartel could be large enough to justify the costs of enforcing an active cartel prosecution regime.

⁵⁰ Opponents to a multilateral framework on competition law are concerned about the costs of implementing competition policy in different countries.

⁵¹ Clarke, J. and Evenett, S. A Multilateral Framework for Competition Policy?. In *The Singapore Issues and the World Trading System: The Road to Cancun and Beyond*. Evenett and Seco (eds), 2003

⁵² Evenett, S. and Clarke, J. *The Deterrent Effects of National Anti-Cartel Laws: Evidence from the International Vitamins Cartel*. AEI- Brookings Joint Center for Regulatory Studies. 2002

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