"Collusion in the Private Health Insurance Market: Empirical Evidence for Chile"

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Abstract

This paper evaluates the merits of the lawsuit that Chile's national prosecutor for antitrust matters (Fiscalía Nacional Económica - FNE) initiated against the five largest private health insurance companies (known as Isapres); which were accused of colluding to reduce the coverage on the health insurance plans they offer. The shift to reduced-quality plans occurred between March 2002 and March 2003. This paper shows that the relevant market is comprised of only "open" Isapres (those which can, in principle, be chosen by anyone willing to pay),and excludes both "closed" Isapres (those exclusive for workers of some particular firms) and Fonasa (the public insurer) because of the high degree of segmentation based primarily on income, age, health condition and gender. Secondly, in an effort to demonstrate the presence of tacit collusion to reduce the financial coverage of health plans, we show the existence of "plus factors" that are consistent with the collusion hypothesis and contradictory to the alternative hypothesis of competition. In particular, by comparing the prosecuted and non-prosecuted open Isapres before and during the collusive period, we show that sales efforts of the accused Isapres were reduced during the transition period toward lower-quality plans, that the profitability of the two groups of Isapres increased, and that the rate of transfers within the group of accused Isapres fell during the transition period.

The results of the empirical analysis are consistent with a collusive agreement among the five largest Isapres in the Chilean market to reduce the level of financial coverage on health plans offered to new members as well as existing members at the time of yearly plan renewal.

Key Words: Tacit Collusion, Isapres, Health Insurance, Conscious Parallelism, Plus Factors.

Classification JEL: L41, D43, I11

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1. Introduction

In September 2005, Chile's national antitrust prosecutor (Fiscalía Nacional Económica, FNE from now on) presented a lawsuit before the Chilean competition court (Tribunal de Defensa de la Libre competencia, TDLC, from now on) against the five largest Isapres on(in?) the market: ING, Vida Tres, Colmena, Banmédica and Consalud. They were accused of having acted against free competition by agreeing to neglect the offer of health plans with "100/80" coverage and focus on marketing "90/70" health plans as a top priority[1], which indicated the presence of a collusive agreement. The collusive act was alleged to have occurred between March 2002 and March 2003. As such, the lawsuit was founded on the idea that the companies mentioned had agreed to reduce the level of coverage offered in health plans for new clients or existing clients who either modified or renewed their plans, as was required on a yearly basis at the time.

This paper demonstrates that the accusation of collusion among the five Isapres was correct since market structure and several market characteristics show that its development cannot be explained by simple strategic interaction among the five companies. Furthermore, strong evidence shows that the evolution of competition on the relevant market and the subsequent results can only be explained by an agreement among the five Isapres to offer a product that was different from one that would be expected under normal competitive conditions.

This work is divided into the following sections. In section 2 we describe the main characteristics of Chile's health insurance industry, we show that the relevant market being analyzed to verify collusion is comprised of only the open Isapres, and we also discuss the existence of barriers impeding entry to (and exit from) this market. Section 3 presents our working hypothesis, where we develop a model of imperfect competition showing how collusion works to sustain an equilibrium with lower coverage than what would normally be found when companies interact in a strategic manner and we discuss how the doctrine of conscious parallelism and plus factors applies to this case. In section 4 we provide empirical evidence of collusion by showing econometrically that two major strategic variables and two outcome variables behaved in a manner that was inconsistent with any hypothesis of strategic interaction between the accused Isapres and, on the contrary, that the evolution of these four variables was perfectly consistent with the collusion hypothesis.. Finally, as a conclusion, section 5 stresses that empirical evidence conclusively proves the collusion hypothesis, reiterating the idea that it is not possible to explain this case as the simple result of strategic interaction among the companies in question.

[1] 100/80 plans cover 100% of hospital visits and 80% of ambulatory care fees and, similarly, 90/70 plans only cover 90% of the first and 70% of the second. In general, these coverage levels were just nominal, as there existed caps on the coverage.

2. Relevant Market and Entry Barriers

This section defines the relevant market and then discusses the barriers impeding entry to (and exit from) the market and the possibility that a potential market power could be exercised in the relevant market. It concludes that the collusive practice argued by the antitrust commission FNE is profitable for the companies principally because it is not possible for potential competitors to enter in a timely manner and to gain a large enough market share.

2.1 The Health Insurance Industry

To fully understand how Chile's health insurance industry operates, we will briefly describe the principal characteristics of private health insurance companies and how Chile's health insurance industry is structured and operates in both the private and public system.

Uncertainty is the central and distinctive force behind health markets according to Arrow (1963), Diamond (1992) and Ferreiro et. al (2003). Uncertainty calls for the use of insurance systems that reduce these doubts, which primarily stem from uncertainty about the loss of profit brought on by the unpredictable occurrence of illness, uncertainty about the results of medical intervention and uncertainty on the patient's behalf regarding the final cost of treatment received. As such, the health insurance market has specific characteristics since demand responds to both a need to insure people in order to protect their wealth and a need to develop the tools of medical coverage as required by social security. On the other hand, the supply of health insurance is characterized by the fact that it uses a combination of diverse ways to grant and limit financial protection in the form of deductibles, co-pay or co-insurance, ceilings on plans or loans and also insurer-specific plans that are closed to protection networks, among other examples.

Based on these characteristics, Chilean legislation states that health insurance is not voluntary for salaried and hourly workers and requires them to pay a minimum premium of 7% of their monthly income into a health insurance plan (up to a maximum wage of 60 “Unidades de Fomento”; [2] approximately US$2,200) per month.

The country's health insurance system is made up of two principal subsystems: the public system (Fonasa) - which is nearly 50% financed by the state - and the private system (Isapre), almost exclusively financed by its members.[3] [4] Chart 1 shows how the population has opted for these health insurance systems in Chile since 1990.

[2] The *Unidad de Fomento* (UF) is an inflation-indexed unit of account authorized by the Central Bank of Chile and used extensively throughout the economy. In April 2007, one UF equalled Ch$19,860 or US$44.
[3] In 2004, nearly 14 million Chileans were covered by health insurance. 79% of them were affiliated with the public system and 21% with the private system. A tiny fraction of the population was covered by military insurance or was not covered at all.
[4] The Isapre system is divided between open and closed Isapres, the latter being exclusively available to employees of specific companies. In the last 10 years, the participation of closed Isapres in terms of the total number of Isapre beneficiaries has fluctuated around 5%.

The Isapre subsystem operates as private insurance, where the benefits available to each member depend on the chosen plan, and it has a "baseline" price that is adjusted according to variables associated with the beneficiary's observable risk (age and gender, for example). Isapres have the right to deny applicants or establish waiting periods for coverage of pre-existing illnesses. The public subsystem, on the other hand, works under a more universal mindset as it does not reject potential members and the benefits it provides are independent of the client's contribution, except for certain co-payments that must be paid by those with higher income (which contribute more for this reason) and have fewer dependents. In addition, for many years Isapres were able to unilaterally modify plans (price, coverage and general benefits) which allowed them to cream-skim the market and influence high-risk beneficiaries (typically the elderly and/or members with chronic illnesses) to switch to the public subsystem. Because of this, Fonasa insurance has become a last resort insurance since those who are cream-skimmed by the private sector must turn to the public subsystem for coverage or opt for self-insurance.[5]

All of these factors have led to a high degree of market segmentation with low-risk, high-income individuals staying in the private subsystem and high-risk, low-income individuals entering Fonasa.[6] As we will show, these arguments are central to defining the relevant market as the one that is serviced by open access private health insurance (the market covered by the group of open Isapres).

Finally, the evolution of this market in recent years has been characterized by a large number of mergers, bringing the total number of open Isapres from 16 in 1999 to just 9 in 2004. This evolution has borne an industry dominated by five Isapres, the same firms that were accused of collusion. These firms boasted nearly one million members among them in 2004 while the remaining Isapres, open or closed, did not serve more than 60,000 members by the same year. In relative size, three of the Isapres accused of collusion counted roughly 250,000 members each, the fourth served close to 150,000 and the smallest company in the group claimed half that figure. However the largest of the remaining Isapres did not exceed more than 25,000 clients in 2004.

2.2 Relevant Market and Segmented Industry

In terms of competition policy, in order to determine the characteristics of a market it is first necessary to define the relevant market. Within the context of the collusion lawsuit initiated by the FNE against the five Isapres in question, the objective is to define a market in which the companies that were summoned are able to exercise market power based on their dominant position as a group. The specific objective then, following the

[5] It was not until 2005 that a law was passed preventing Isapres from unilaterally modifying their plans, a measure that was implemented in 2006.

[6] The fact that salaried and hourly employees are required to pay a minimum of 7% of their monthly wage up to an income of 60UF (a maximum premium of 4.2 UF) contributes to this segmentation. Since consumers cannot "force" the potential insurers to compete among themselves in price, insurance companies do so with variables such as quality of health care in areas where Fonasa cannot compete because of fewer resources and its less desirable "risk pool".

same criteria used by the US Department of Justice, is to define a market where the Isapres would be able to exercise market power if they were capable of coordinating their actions.

To determine the relevant market, it is necessary to consider a market where a hypothetical monopoly exists. If it is profitable for a monopoly to permanently and significantly reduce the quality of the service offered (coverage of health plans), the market in question constitutes the relevant market. If such conditions would not apply, it is necessary to consider the best substitute and re-evaluate the profitability of reduced coverage. It is important to note that the relevant market is the smallest possible one that allows for a permanent and significant drop in quality or coverage of the plans being offered.

In the case of health insurance like the one offered by Isapres, the only two substitutes consumers have are self-insurance and Fonasa since catastrophic insurance is complementary for most of the population due to the fact that health insurance is obligatory. However, as we will soon see, neither of these alternative options are part of the relevant market served by Isapres.

In general, Fonasa is not a good substitute for a large fraction of the market. The main reason for this is that - due to the universal nature of Fonasa - its protection is fundamentally limited to the public health system. That is, the factor that differentiates Fonasa insurance from that offered by an Isapre is access to health services. In fact, within the public health system, there are high levels of congestion in hospitals and on health services associated with Fonasa, implying that the length of time an individual must wait between the time he or she seeks medical attention or requires a medical exam and the actual moment at which the client receives the service or exam is much longer than the time that passes in private hospitals where most Isapre clients have access. This industry segmentation has been documented by various authors, including Aedo and Sapelli (1999), Larrañaga (1997), Sapelli and Torche (1997), Titelman (1999) and even the Isapre association (2006) itself.[7]

In spite of the fact that signing up for health insurance is separate from the health services actually offered, market segmentation leads the consumers to link insurance with service. The following Figures and charts show the presence of major segmentation based on income, age and number of dependents. This is why, for a significant portion of the population, the degree of substitution between Fonasa and Isapres is very low.

Table 1 clearly shows that i) the population with higher income gravitates toward the Isapre system (and therefore away from Fonasa) and ii) the frequency of people in an Isapre decreases as age increases for each income decile group. The same outcome can be seen in Figure 2, which illustrates segmentation by age for the entire population.

[7] The statements made by these authors are corroborated by the general response of users in opinion polls, who considered the health services and medical attention offered by public hospitals to be lower quality than those offered by private clinics (MORI poll, El Barómetro de Isapres Nº 1 of 2004).

On the other hand, Table 2 shows for distinct income decile groups how health condition (as reported by customers in Casen 2003) affects the probability of belonging to Isapre or Fonasa. For example, 65.1% of the people in the tenth decile group that declare Very Good health are in Isapres, a figure that falls to 28.3% and 1.9% when health is declared to be Bad or Very Bad, respectively. This pattern is generally repeated in each income decile group.[8]

The market segmentation that has been illustrated by analyzing the different variables can be confirmed by doing a non-linear multivariate regression analysis. This was done by estimating a dichotomous model of the probability of belonging to the Isapre subsystem. The estimation was done using the Maximum Verisimilitude method with data from the Casen 2003 survey. The probability of having health insurance with an Isapre is modeled as a function of: gender, age, age squared, income per capita per household, a dummy variable if the person claims to be in good or very good health and another dummy variable equal to 1 if the person claims to be in bad or very bad health.[9]

Regression results are shown in Table 3. They confirm how the distinct variables are relevant in a consumer's decision to join an Isapre. Being male, having good health, and earning a higher income increase the probability of belonging to the Isapre system. Having bad health and having more people in the household reduce that probability.

Figure 3, based on this information, shows the prediction for varying age groups of the probability of men and women to belong to an Isapre, namely those who claimed to be of good health (Very Good or Good in the survey) or bad health (Very Bad or Bad in the survey) while the rest of the variables remain constant. The Figure very clearly shows that - although income remains the same - Isapres tend to specialize in lower risk beneficiaries: middle-aged, in good health and, systematically, men.

The segmentation by income and risk that can be found on the insurance market along with the contrast between Fonasa's universal coverage and the Isapres' private insurance scheme have a simple consequence: Fonasa is not an attractive option for high-income, low-risk segments since its service is spread thin for beneficiaries with few resources and its expenses are tagged principally for higher-risk members. It is precisely this segment of the population over which Isapres would be capable of exercising market power without losing a large number of clients.

Table 4 presents a different view at income-based segmentation in the health subsystem. This table allows a glimpse at the relative importance that diverse levels of income play in the Isapre and Fonasa portfolios. Beneficiaries that belong to the three top income

[8] It is important to note that people in bad health that belong to Fonasa (or an Isapre) do not have the option of switching to an Isapre (or a different Isapre) since they would be rejected or charged a very high premium.

[9] As such, groups of clients claiming regular health or groups that did not know the state of their health were excluded.

deciles constitute nearly 70% of the Isapre portfolio while they make up less than 18% of the Fonasa portfolio. This explains why Isapres have concentrated on these target groups of the population: they are higher-income individuals and therefore pay a higher premium into health insurance (note that, except in the tenth decile, the premium paid increases with the member's income). The same table shows that the majority of Fonasa members are found in the poorest deciles although the exclusion of high-income members is less marked than what appears among the lowest-income members of the Isapre subsystem. This is due to the fact that Fonasa is an insurance provider that cannot reject clients, resulting in a portfolio that consists not only of low-income individuals but also middle- and high-income people that have been rejected by Isapres due to their health status.

It also becomes apparent in Figures 4a) and 4b) that Fonasa's clients are older and report a poorer health status on average than the population that signs on to Isapres, which reflects yet again the type of cream-skimming done by Isapres in Chile.

In summary, market segmentation, which divides the market between private and public health insurance for a broad range of the population, is corroborated by independent opinion polls, can be deduced from consumer decisions according to the Casen 2003 survey and is explained by several economists who specialize in the health economy. This allows us conclude that for a major portion of the population that has signed onto an Isapre, the relevant market is solely that of health insurance offered by open Isapres since Fonasa is not a genuine alternative for them (at least not as long as they enjoy good health and income).

2.3 Entry Barriers and Potential Abuse of Market Power

Once the relevant market - that of open Isapres - has been determined, it is necessary to show that a collusion strategy aimed at diminishing rivalry on the market can be successful. We argue that the market of open Isapres has enough entry barriers to facilitate a possible collusive practice. Such barriers are caused by factors that make it difficult to enter and other factors that make it difficult to leave the market. We also show that a possible newcomer in the market is not a factor that would discipline companies already established in the market.

First, it is important to outline our understanding of what constitutes a barrier to entry, which is why we cite the definitions that are widely accepted in literature discussing industrial organization and competition policy. Entry barriers are the factors that allow pre-established companies on a market to gain above-normal income without the threat of entry by potential competitors (Bain 1956; Stigler 1964). According to Stigler, entry barriers are understood to be the additional long-term costs that must be incurred by an incoming company compared to the long-term costs faced by a company already on the market.

In practice, it is very expensive for a new Isapre to take clients away from the dominant Isapres that have decided to offer health plans with less desirable features to the population. That is, there are barriers to entry as defined by both Bain and Stigler in the

sense that it is difficult to challenge the dominant Isapres in the system. Effectively, although a new Isapre has no major requirements in terms of financial capital in order to be able to operate (relative to its business volume), if the Isapre wishes to enter under the same conditions as the dominant Isapres it must secure long-term contracts with a wide range of doctors and specialists, with clinics that sign on to agreements for the new company's members and with institutions that provide medical services. Being able to do this requires allocating an enormous sunk cost to a sales force dedicated to attracting providers, to negotiation teams, to advertising and to a sales force that specializes in enticing a high volume of members to sustain the agreements, etc. Additionally, the costs that this new hypothetical Isapre would pay in order to sign agreements with clinics and other medical institutions are greater that the costs that pre-existing Isapres can negotiate mainly because the number of members at the new company will be very low for a long time.

Consistent with the previous explanation, market entry is possible in two ways: either by acquiring an existing Isapre or simply entering operations as an Isapre that cream-skims the market and operates entirely by recovering expenses from members. The first option is irrelevant to a collusion analysis of the main Chilean Isapres since the Isapre that is purchased would already be part of a collusive agreement. The second option is only relevant if it is understood as the entry of a financial entity aiming to compete at the cream of the market, which does not constitute a major portion of members covered by private Isapres in the country, and also if it is understood that the new Isapre would run an enormous risk upon being affected by adverse selection in its niche market.

The arguments put forth in the previous paragraphs might explain why there has been no major entry in the Chilean market in recent years. There mainly have been acquisitions of pre-existing Isapres that already boasted a large volume of users. As a result, the market of open Isapres in Chile reflects sizeable entry barriers, in particular barriers related to the costs of providing members with insurance services that are rooted in the same factors that have allowed existing companies to differentiate the product they offer, generating a certain degree of "loyalty" in their favor. This last point is upheld principally because users are faced with switching costs when changing to a different Isapre, rather than because of an actual loyalty to the service that the Isapre offers.

There are switching costs that make the switch to a different Isapre more difficult. First, it is necessary to take time to compare the different plans offered by other Isapres and the cost of each one. This is not as easy as it may seem. Evidence in Chile shows that, in the case of AFPs (private pension fund managers), users do not spend much time comparing which AFP charges the lowest commission. In addition, most people do not know how much commission they pay and some do not even know what a commission is. The information dilemma found on the AFP market is not much different in the case of Isapres, as seen in the poll entitled El Barómetro de Isapres Nº 1 de 2004 in which 47% of Isapre members claimed to be ill-informed about how to access the services offered by their Isapres. The same poll reported that 75% had no intention of changing to a different Isapre.

The cost of becoming informed is also manifested in the great uncertainty a person faces when comparing alternative plans from Isapres other than the one to which he or she is a member. In effect, users know that the total number of plans on the market per Isapre exceed the thousand mark. However, any given Isapre sales agent only shows a small number of options, no more than 10 possible plans. It is clear to a rational consumer that if the Isapre offers him less than 1% of the available plans, it is because the agent is offering only those plans that are convenient for the insurer and not necessarily convenient for the user. This asymmetry of information creates a strong resistance to change, which prompts the user to switch Isapres only in the event that staying with the same insurer comes at a higher cost (for example, when the Isapre rejected a specific service).

An important detail to point out is that - precisely because information is hidden from the member - the possibility of using and abusing this asymmetry of information would be a mechanism for facilitating collusion among Isapres. In the end, the plans with 100/80 coverage were never eliminated. It is merely that the Isapres stopped offering them to new members as of 2002.

A second switching cost, which is very important for some users in the system, is related to chronic or pre-existing illnesses or other severe illnesses like cancer or tumors. In this case, the cost is highest since the customer will be rejected by every Isapre he tries to access or, failing that, he will be charged a very high premium by the new Isapre.

The switching-costs a user faces when he wishes to change insurer represents a barrier to exiting the system. The main economic effect is that the company providing the service, in this case the Isapre to which the customer subscribes, wields market power over clients. Economic theory and empirical evidence both show that the main result of high switching-costs for changing insurance companies - which leave the consumer "locked-in" with the same provider - is a less competitive market and that the prices are higher than in a scenario without these costs (Biggs and Klemperer, 1992; Klemperer, 1987; Klemperer, 1995).

In summary, the Isapre market not only shows high barriers to entry but it also leaves room for abuse of market power due to the existence of high barriers to exit at the same time. So, in the case of collusion in this market, it would certainly yield financial benefit for Isapres that took on such a strategy.

In the end, even if it were possible to enter the market of open Isapres, there is no scenario in which the dominant position held by collusive Isapres would be threatened. In order for the potential entry of a company to actually prevent established companies from possibly exercising market power on the relevant market, the entry must be likely, timely and sufficiently large.[10]

[10] It is necessary to clarify that of these three conditions: i) the probability of entry depends fundamentally on the idea that it is profitable for a company to do so since it implies incurring sunk costs at competitive prices and not on prices as they were prior to entry, a situation which must be evaluated; ii) in order for the effects of a competitor's entry to reduce the market power of established companies, it is necessary for

To evaluate whether it is likely for a new competitor to enter the private health insurance market to compete in a timely manner that is large enough to restore competition, it is necessary to consider all of the steps that a new Isapre must undertake to produce and sell on the relevant market. To that end, it is important to consider all of the processes involving planning, design, permissions, permits, construction, advertising, distribution, etc. First, it is necessary to analyze whether a new firm would be able to produce a significant impact on the market within a reasonable period of time. A reasonable period is generally accepted to be within one to two years since a longer period would be too long to prevent a possible abuse of market power.

Second, it is important to evaluate whether market entry would be profitable and, as such, a likely response to successful collusion. An Isapre that is considering entry to the market must look at the profitability of its actions under the assumption of a long-term participation on the market since it involves sunk costs. The entry of a new competitor that counteracts the competitive effects of successful collusion will necessarily bring the market price back to the levels registered before collusion. This is why the profitability of a potential entrant must be evaluated based on the market prices that existed before the collusive conduct.

One element that must be taken into special account in this analysis is the Minimum Viable Scale (MVS). This consists of the minimal level of members on average that an entrant must have - at prices as they stood before collusion - in order for it to be profitable to enter and remain on the market. The MVS hinges on the anticipated revenues and associated costs, including a rate of return that is higher than the invested capital. This is why the MVS is relatively high when the fixed costs of entry are high, when the costs of entry are principally sunk costs and when the marginal costs of production are high when set against low levels of production. This means the probability of entering the market is very low if the MVS is greater than the volume of sales available to potential entrants. That same volume of available sales is primarily dictated by a reduction of sales as would result from the anti-competitive effects of collusion and depends upon the entrant's ability to attract a fraction of the anticipated growth of demand on the market. On the other hand, the volume of sales available to the entrant can be low because the incoming firm is excluded from a major portion of the market.

Thirdly, it is necessary to evaluate whether the likely and timely entry of a new competitor will be large enough to restore competitive equilibrium on a market that has become less competitive after collusion. This effect can be achieved by the entry of a single competitor with large enough scale or of several small competitors that collectively achieve such scale.

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prices on the relevant market to be impacted relatively quickly; and iii) although a competitor's entry may be probable and timely, in order for it to successfully affect competition on the relative market it must also be large enough to return prices to competitive levels, something that could happen via the entry of several new competitors or via the entry of a single competitor of large enough scale.

With the aim of gaining an idea of the market percentage that an entrant Isapre could attract, we have drawn up a simulation based on the best possible scenario for a hypothetical entry. Using historical data of transfers between Isapres in the 1999-2004 period, the simulation considers the case of an Isapre that enters at the beginning of this period and successfully attracts members at the same rate as the Isapre that attracted the highest number of members each month. This indicates that the incoming Isapre is the most successful of all Isapres in attracting members away from the other firms. The results of the simulation are shown in Figure 5.

As can be seen, a new Isapre would take 4 years (48 months) to gain a market share of between 8 and 9%, which shows that an entrant would have too low of an impact to impose market discipline fast enough. This is why collusion, in this case by offering lower-coverage plans, can be a successful strategy given the time it would take for members to move to a different Isapre.

3. Theoretical Considerations

Explicit collusion is prohibited by Chilean law and its detection is directly related to tangible or physical circumstantial evidence that proves unlawful activity rather than economic arguments revealing the action. At the same time, implicit or tacit collusion is also prohibited by law (called "tacit agreement" or "concerted practice", according to Article 3, Letter a of DL 211) and has exactly the same economic consequences as explicit collusion, but its detection is reversed: rather than tangible evidence, economic arguments are used to show how results of the market being analyzed are the consequence of collusion and not of simple strategic interaction between competing companies.[11]

Consequently, we choose to demonstrate collusion by assuming that it was tacit since we have no tangible or physical evidence of a possible express agreement, but rather a series of plus factors that show empirical evidence of collusive conduct. We will continue along this line even when it becomes clear that the agreement could only have been explicit - not tacit - merely because an explicit agreement is not verifiable.[12]

We first present our hypothesis of how the Isapres in question could have implemented their collusive strategy. Secondly, we discuss various elements of the doctrine known as conscious parallelism and plus factors. We argue the point that this doctrine and tacit collusion are the same in the sense that both show that the structure, the observed conduct

[11] The concept of tacit collusion was initially developed by Chamberlin (1933) and formally proven by Friedman (1971) using game theory. Currently, the concept is widely used in industrial organization as reported by Jacquemin (1987), Tirole (1988), Jacquemin and Slade (1989) and Shapiro (1989) in their books and surveys on the material.

[12] It is arguable that implicit collusion is not verifiable as it is public knowledge that a "framework agreement" may have existed on the market agreeing to stop offering 100/80 plans. In addition, a senior executive from one of the Isapres accused of collusion admitted to the TDLC that the Isapre Association allows "any Isapre to view the behavior of competition in the very short term."

and the market's performance in the presence of collusion are not in line with a strategic interaction between the companies. Finally, this section ends with a standard model of imperfect competition and tacit collusion with the level of coverage on health plans offered by these Isapres standing as the strategic variable.

3.1 Working Hypothesis

Our results are based on the following working hypothesis, consistent with the stylized facts already described: open Isapres compete among themselves, especially for a market of users who have higher incomes, are younger and have generally more desirable characteristics in terms of finances and health, resulting in a competition that can express itself through multiple dimensions or strategic variables. One of these variables that Isapres use for competition is health plan coverage; everything else constant, lower coverage makes it less desirable for users to stay in their Isapre. Then under an imperfect competition equilibrium or a Nash equilibrium, the level of health plan coverage determined will be higher than the coverage determined under a collusive agreement among Isapres with market dominance.

So when an Isapre reduces health plan coverage without altering any other feature of the health insurance and has not colluded with other Isapres, it could be expected that: i) the other Isapres would compete to attract the clients of the Isapre offering lower-coverage plans, which they would do by utilizing the strategic variables within their reach, namely by spending more on advertising and sales force; and ii) it would result in a higher number of transfers away from the Isapre that unilaterally decided to reduce coverage toward the other Isapres that represent its closest competitors and have not changed the features of their health plans.

The exact opposite should be expected in the presence of collusion. That is, the Isapres that have not altered the characteristics of their plans and that have become involved in a collusive agreement would have to lessen their degree of rivalry in order to make the agreement credible and facilitate its existence. This type of strategy can be achieved by spending less money on advertising and sales force and the number of transfers between Isapres in collusion would fall while the market adjusts toward a collusive equilibrium with lower-coverage health plans.

The predictable consequence - as shown in the theoretic model we develop further on - is that Isapres involved in collusion gain significant economic benefits, which also occurs with Isapres not involved in the collusive agreement while they maintain strategic interaction with colluded Isapres.

Finally, in regard to the collaborative strategy mentioned, our goal is to demonstrate that this collusion concept is upheld by empirical evidence, a contrast that does not stand up to the null hypothesis of imperfect competition or strategic interaction without collusion.

3.2 The Conscious Parallelism Doctrine and Plus Factors

Economic theory presents two types of possible collusion. The first is explicit collusion, where companies agree to behave a set way, for example by raising prices, that allows them to obtain economic profits greater than zero. The second is implicit or tacit collusion, where companies behave in a parallel manner that also allows them to increase their economic profits to greater than zero. In both cases, the outcome is a market equilibrium that moves away from competitive equilibrium or strategic interaction between companies in the industry and moves closer to a monopoly equilibrium.

The fundamental difference between explicit and tacit collusion is the communication that occurs between companies. Although both types are difficult to detect, the case of explicit collusion has the possibility of being discovered, as happens in developed nations with the seizure of computer equipment (hard drives from the personal computers of senior executives and even institutional machines), documents, faxes and e-mails that make reference to agreements between companies participating in collusive agreements.

By definition, a case of tacit collusion is impossible to detect with evidence of communication between companies, meaning that it must be inferred from acts of parallel behavior between companies that allow them a monopolized equilibrium. Obviously, in many cases there are market conditions that affect all companies and prompt them to behave in similar ways as a response to shock in the industry. This is why it does not suffice to analyze parallel behavior when inferring tacit collusion. It is it also necessary to consider the plus factors.

It is in this sense that tacit collusion and conscious parallelism are used interchangeably in the economic literature while keeping in mind that the second term looks at plus factors that allow parallel behavior to be differentiated from simple interaction between competing companies. Both terms refer to the fact that the companies have tacitly and illegally colluded to exploit their market power, a move that results in the companies adopting similar or "parallel" actions.[13]

As was mentioned, the existence of consciously parallel behavior is necessary but not sufficient to be classified as tacit collusion. This is why it is also important to consider other elements that help infer tacit collusion. The main objective of these additional elements (called plus factors in the US legal system), is "to exclude the possibility of each company acting completely independently in accordance with its unique interests." Based on this doctrine, there have been several cases in US courts where tacitly collusive behavior has been inferred from the parallel conduct of companies accompanied by plus factors, resulting in conviction.[14]

[13] See a summary of this doctrine in Viscusi, et. al (1999). Details can be found in Turner (1962), Lopatka (1976) and Posner (1976). In this paper, conscious parallelism with plus factors are considered to be synonymous with concerted practice. Baker (1993) and Kovacevic (1993) show why both concepts carry the same degree of illegality in courts as explicit collusion with circumstantial evidence does.

[14] See the cases: Matsushita Elec. Indus. Co. vs. Zenith Radio Corp., 475 U.S. 574 (1986) and Monsanto Co. vs. Spray-Rite Serv. Corp., 465 U.S. 752, 764 (1984). Other well-known cases in economic literature are Interstate Circuit Inc. et. al vs. the United States (1938) and American Tobacco Company et. al vs. the

3.3 A Competition Model and Tacit Collusion

Let's assume that a mass of users who demand health insurance are divided according to their household income. Separated thus, as of a certain income level, the demand for health insurance does not depend on the prices charged by each Isapre but exclusively on the percentage of medical services covered. Additionally, each user is risk averse and faces two states of nature: one where he suffers a financial loss of ***L*** due to health reasons, occurring with probability ***p***; and another one where he suffers no financial losses due to health problems.

Users are uniformly located in a circle with perimeter 12, precisely the size of the population whose wealth is ***W***. Also, the system's 12 Isapres are located at an equal distance from one another in 0,1,...., 11. We will call the Isapres ***A***,***B***,....***K*** and ***L***, respectively.

To offer these health insurance plans, we will suppose that the companies are competing on this market segment (as in many others), where each of them has attributes making them different from their rivals in the eyes of the users of the system (competition in differentiated goods). Since we have assumed that the users are not looking at prices because of their income, the Isapres compete with the level of coverage offered in their health plans. Each user located between Isapres ***A*** and ***B*** can only choose between these two because "transportation" ***t*** costs are linear, meaning that it would not be cost-efficient to go to the Isapres which are farther away. So the user who is indifferent between these Isapres will be placed at point ***α***, with $0 < \alpha < 1$ and satisfies:

$$pu(W - R - L(1 - x_a)) + (1 - p)u(W - R) - t\alpha = pu(W - R - L(1 - x_b)) + (1 - p)u(W - R) - t(1 - \alpha)$$

Then the indifferent user will be placed at:

$$\alpha = 0,5 + \frac{p}{2t}[u(W - R - L(1 - x_a)) - u(W - R - L(1 - x_b))]$$

Similarly, for every pair of Isapres an indifferent user is located at a point indicated by the Greek letter of the Isapre that precedes it. Thus, users that are located between 11 and 0 can choose between Isapres ***L*** and ***A***, with the user who is indifferent to these Isapres being located at ***λ***:

$$\lambda = 11,5 + \frac{p}{2t}[u(W - R - L(1 - x_l)) - u(W - R - L(1 - x_\alpha))]$$

United States (1946). Although there was no evidence of collaboration or overt communication in the two latter cases, the parallel conduct and plus factors shown were sufficient for the Supreme Court to convict the companies of illegal conspiracy.

In an (imperfectly) competitive market each Isapre maximizes its benefits by conjecturing about the coverage chosen by its rivals. So, for a payment ***R*** that each user makes and for a certain segment of this market, Isapre ***A***'s problem is:

$$\underset{x_a}{Max}\left(R - x_a\, pL\right)\left[1 + \frac{p}{2t}\left(2u(W - R - L(1 - x_a)) - u(W - R - L(1 - x_b)) - u(W - R - L(1 - x_l))\right)\right]$$

Supposing for extreme simplicity that the utility functions are on the limit linear, risk-neutral, the problem is:

$$\underset{x_a}{Max}\ (R - x_a pL)\left[1 + \frac{pL}{2t}(2x_a - x_b - x_l)\right]$$

So Isapre ***A***'s reaction function is:

$$x_a = \frac{R - t}{2pL} + \frac{1}{4}(x_b + x_l)$$

Following the same process for all of the remaining Isapre pairs, the reaction functions can be determined. Table 5 summarizes the system of equations (12) and unknowns (12) to be solved as a result of this strategic interaction.

It is easy to see that symmetrical coverage between Isapres must be fulfilled in a Nash equilibrium. If we call this value ***x****, this is:

$$x^* = \frac{R - t}{pL}$$

And the profits for each company are:

$$\pi_a^* = \pi_b^* = \ldots = \pi_l^* = t$$

Let's assume that 10 Isapres (from ***B*** to ***K***) - which originally represent 83.33% of the market - collude and operate as a single company that sets one level of coverage for its health plans, without second degree discrimination by offering plans with different coverage. Let ***x*** represent the coverage chosen by the colluded companies. The problem of these Isapres is:

$$\underset{x}{Max}\left(R - xpL\right)\left[10 + \frac{p}{2t}\left[2u(W - R - L(1 - x)) - u(W - R - L(1 - x_a)) - u(W - R - L(1 - x_l))\right]\right]$$

Once again, assuming that the users are almost risk-neutral, the problem is simplified to:

$$\underset{x}{Max}\ (R - xpL)\left[10 + \frac{pL}{2t}(2x - x_a - x_l)\right]$$

So the reaction function of these colluded companies is:

$$x = \frac{R - 10t}{4pL} + \frac{1}{4}(x_a + x_l)$$

On the other hand, Isapre ***A*** (one of the two not involved in collusion) has the following problem:

$$\underset{x}{Max}\left(R - x_a pL\right)\left[1 + \frac{p}{2t}\left[2u(W - R - L(1 - x_a)) - u(W - R - L(1 - x)) - u(W - R - L(1 - x_l))\right]\right]$$

Linearizing the utility function and optimizing the problem, the reaction function becomes:

$$x_a = \frac{R - t}{4pL} + \frac{1}{4}(x + x_l)$$

Similarly, the reaction function of Isapre ***L*** (the second Isapre not involved in collusion) is:

$$x_l = \frac{R - t}{4pL} + \frac{1}{4}(x + x_a)$$

Isapres ***A*** and ***L*** have a symmetrical problem and their equilibrium coverage must have the same problem as the reaction functions of these companies are equal to:

$$x_a = x_l = \frac{R - t}{3pL} + \frac{1}{3}x$$

Replacing this result in the collusive cartel's reaction function, the equilibrium coverage of the companies involved in collusion can also be found:

$$\boxed{x^+ = \frac{0,5R - 3,2t}{pL}}$$

Backing up a bit, the equilibrium coverage of Isapres not engaged in collusion is:

$$x_a^+ = x_l^+ = \frac{0,5R - 1,4t}{pL}$$

Consequently, the profits of each Isapre as a result of collusion by a subgroup of them are:

$$\text{Not in Collusion}: \pi_a^+ = \pi_l^+ = 1,4R + 3,92t$$
$$\text{In Collusion}: \pi_b^+ = ... = \pi_k^+ = 0,41R + 2,62t$$

The variation in consumer welfare due to this collusive strategy can be determined by comparing the utilities received from the coverage in the Nash equilibrium, with and without collusion. So, collusion generates the following change in consumer welfare:

$$\begin{aligned}
\Delta EC = {} & [\alpha^+ + (12 - \lambda^+)][pu(W - R - L(1 - x_a^+)) + (1 - p)u(W - R)] - \\
& [\alpha^* + (12 - \lambda^*)][pu(W - R - L(1 - x_a^*)) + (1 - p)u(W - R)] \\
& + \\
& [\beta^+ - \alpha^+][pu(W - R - L(1 - x_b^+)) + (1 - p)u(W - R)] - \\
& [\beta^* - \alpha^*][pu(W - R - L(1 - x_b^*)) + (1 - p)u(W - R)] \\
& + \ldots + \\
& [\lambda^+ - \kappa^+][pu(W - R - L(1 - x_l^+)) + (1 - p)u(W - R)] \\
& [\lambda^* - \kappa^*][pu(W - R - L(1 - x_l^*)) + (1 - p)u(W - R)]
\end{aligned}$$

By substituting the equilibrium values that were found and using the assumption of risk-neutrality in the limit in order to be able to quantify the results, we see that consumers are undoubtedly worse off with collusion. The exact value of how much consumers lose depends on their incomes (how much they pay for their health plans) and on the parameter that measures the degree of differentiation for each user by being in one Isapre versus another.

$$\Delta EC = -6R - 19,56t$$

Various conclusions are extracted from this model, which are then contrasted empirically. The model is extremely simple and aims to show the effects that a collusive agreement among a subgroup of Isapres has on the coverage of health plans, the benefits at all the Isapres, and the welfare of consumers covered by these companies. The consequences are:

* The agreement to reduce competition for plans offered by the relatively largest companies on the market leads to a reduction in the coverage offered by the Isapres in question, as well as by those competing with the companies in collusion. However, the companies that remain outside of the cartel reduce the coverage offered on their plans to a lesser degree.

* Profits for all of the companies increase dramatically with the reduction in coverage, with those companies not in the collusive cartel gaining a larger percentage because more users migrate to them as a result of diminished coverage at the companies in collusion. In practice, it is possible that transferring to a smaller Isapre does not have as much of an impact since the costs associated with changing from a large Isapre to a smaller Isapre are greater than changing among large Isapres - an asymmetry of costs which was not modeled.

* Due to the aforementioned results, the users of system are the big losers. Through collusive practice the coverage in hired health plans is reduced. For a given expected financial loss, the Isapres receive economic rents similar to the surplus loss the consumer experiences in our model. Social welfare is also affected if we take into account that the infinite inelasticity of demand for health insurance that we have assumed is an abstraction; as such, in reality a drop in coverage should also mean a loss in the allocation of resources. The same situation would be exacerbated in practice if we also consider that users insure themselves because they are risk-averse thus a reduction in coverage further reduces their welfare.

4. Empirical Evidence

The empirical strategy for testing collusion consists of showing that the market reveals behavior that cannot be explained by the simple strategic interaction of companies. For this purpose we use a difference-in-difference estimation which allow us to test the predictions from the previous theoretical results [15]

In order to make the presentation of empirical evidence more systematic, this section has been organized keeping in mind the doctrine of conscious parallelism and plus factors. This doctrine makes reference to plus factors which are consistent with the collusion hypothesis but not with the competition hypothesis. We show here the existence of four plus factors, specifically four stylized facts of different industry variables consistent with the collusion hypothesis but not the competition hypothesis. These plus factors are: the behavior of profitability at Isapres that were and were not involved in collusion, the rate of transfers among Isapres, expenditures in advertising and expenditures in sales force. The first plus factor is an outcome variable in this market, the transfer rate synthesizes the degree of competition in many possible strategic variables, while expenses on advertising and sales force directly measure what happened to rivalry between the companies in question during the collusive period.

Each one of these plus factors explains how it is possible that the five Isapres accused of collusion would have engaged in a practice tending towards limiting competition on the relevant market, something which would not have been possible under competitive terms

[15] The information we use in this analysis is public or the econometric results are public. All the results are reproduced from Agostini et. al (2006).

or simple strategic interaction among the companies. The four factors presented here offer strong evidence against the competition hypothesis and, thus, is strong evidence that the only possible explanation is that of tacit collusion.

4.1 Increased Profitability for All the Companies

As can be expected from a collusion model and as formally demonstrated in the previous section, the strategy to agree to reduce competition in the market generates important economic profits for companies working in collusion as well as for those companies that are outside the agreement. We show here that this is precisely what took place from the time period in which the dominant Isapres in the system colluded, a situation that caused a change in all the companies' profitability that could not have occurred through strategic interaction among the companies.

A simple way of measuring profitability is the operating margin rate (OMR), which is calculated for each Isapre as the margin divided by their operating revenues. Figure 6 shows the quarterly OMR for each of the five Isapres accused of collusion during 1999-2004.

The predictions of the theoretical model drawn up in the previous section establish that in the case of collusion, profitability at all of the companies present in the market increases, including those that collude and those that do not. A regression using quarterly data for the 1999-2004 period was estimated with the objective of empirically testing this prediction. The dependent variable in the regression is each Isapre's OMR, while the explanatory variables are:

Trend: Quarterly trend variable (1, 2, ... , 24)
D_ProfCollusion: Dummy variable equal to 1 for all the Isapres from the first quarter 2003 going forward
D_ProfCollusion*Trend: Interaction of the previous two variables (equal to zero until the fourth quarter 2002 and equal to the trend starting in the first quarter 2003)
D_ProfCollusion*D_Colluded: Interaction of ***D_ProfCollusion*** with a dummy that is equal to 1 for all five colluded Isapres

In order to estimate if there is a structural change in the OMR trend after the second quarter 2002, which is when the five Isapres in question started modifying the plans they offered, a dummy variable was constructed that is equal to 1 starting the first quarter 2003 (***D_ProfCollusion***). The reason why we test if there was an increase in profitability starting in 2003, as opposed to the second quarter 2002, is because the benefits of collusion appear with delay. Initially, only new consumers were confronted with the supply of 90/70 plans since, by law, the Isapres cannot unilaterally modify their contracts until the time comes for each beneficiary's annual plan renewal. So, it is reasonable to assume that adjustments to the plans of existing clients were carried out during all of 2002 and part of 2003. Consequently, we choose a moment in between the beginning of the practice (May 2002) and the following year to a point we believe it is reasonable to have finished, which is the first quarter 2003.

Additionally, in order to capture the differences between the Isapres that potentially colluded and those that did not, a dummy variable was constructed which distinguishes the group of Isapres that allegedly colluded from the rest of the Isapres. This dummy variable was interacted with (multiplied) the previous one to be able to test if the variation in the colluded Isapres' profitability differed or not from the profitability of those Isapres which did not collude (***D_ProfCollusion*D_Colluded***).

The regression was estimated using ordinary least-squares and the standard errors of the coefficients were calculated using the Huber-White estimator, therefore they are robust to the presence of heteroskedascity and autocorrelation. Table 6 presents the results of the estimation.

Almost all the coefficients are significant and the regression adjustment, measured by R^2, is reasonable for a regression with panel data. The results show the expected signs for each coefficient according to the theoretical prediction. The positive coefficient of ***D_ProfCollusion*Trend*** indicates a structural change in the market profitability trend starting in 2003. The structural change leans towards greater profitability and is statistically different from zero with 95% confidence, which rejects the null hypothesis of competition and does not reject collusion as the alternative hypothesis. This change of trend can be seen in Figure 7. Consistently, the variable ***D_ProfCollusion***, which is equal to 1 for the 2003-2004 period, is negative and significant.[16]

In addition, the estimated coefficient for ***D_ProfCollusion*D_Colluded*** (the collusion dummy interacted with the dummy of the Isapres accused of collusion) is negative, even though not significant. This indicates that the profitability of this group of Isapres increased less than the system's profitability after the structural change. Although the coefficient is not statistically significant, this result also does not allow us to reject the hypothesis of collusion because we know that those companies that were not a part of the collusive agreement should have benefited at least as much as those companies that colluded.

Finally, it is important to note that the regression includes fixed effects by quarter, which allows us to capture unobserved quarterly shocks that affected the whole industry. That is, any shock that affected the whole industry each quarter of the sample period has already been considered in the regression.

Consequently, the explanation of competition or "strategic interaction" is empirically ruled out by using the evolution of each company's profitability, colluded or not, as a plus factor that explains the collusion. Equally, by including Isapre's fixed effects we can capture unobservable characteristics of each Isapre (or those not explicitly considered in the regression) which do not change over time, thereby allowing us to rule out as an

[16] These empirical results are consistent with what the Isapres themselves pointed out to the TDLC. Colmena, for example, mentions that “during 2002-2004, all the open Isapres - and among them all those that were not accused of collusion by the FNE - increased their operating income” (page 55, presentation to the TDLC).

explanation for these results that the collusive Isapres have specific unobserved characteristics that are different from those of Isapres that were not involved in collusion.

4.2 Transfer of Members among Isapres

The level of competition between companies can potentially manifest in a variety of variables that go beyond the price or coverage of plans, such as a certain level of price competition via discounts on additional charges, competition in the quality of providers associated with each Isapre, or expenses in advertising and sales force. Many of these strategic variables are difficult to observe, which is why an analysis of a variable that directly measures the level of competition is helpful. This is done by considering the rotation of members among the different Isapres as a proxy for rivalry in this market.

We will now discuss the competition and collusion hypotheses, followed by a presentation of the empirical analysis which we will show to be consistent with the latter and not the former.

Based on the hypothesis that the market was competitive before and after the five Isapres in question reduced the health plan coverage, the change in the supply of 100/80 plans to 90/70 plans would have an effect on transfer rates between and within the groups of colluded and not colluded Isapres. Given that unobserved factors may exist which affect the industry as a whole, it is relevant to compare the degrees of member rotation in both groups, so that the group of Isapres not accused of collusion acts as a "control group" against which the changes that occur in the group of suspect Isapres would be evaluated. This is the only way to implicitly control for possible shocks that could affect all of the Isapres (for example, an announcement of regulatory changes and changes in relative prices, among others).

Within a competitive context, in which some firms start offering an "innovative and more efficient" product, a greater rate of transfer should be expected within the group of Isapres accused of collusion, especially because not all Isapres started the change the same month, but adopted the new commercial strategy gradually and sequentially. It should at least be expected that mobility within the group of Isapres in question not be significantly lower than the mobility observed within the group of Isapres not accused of collusion.

But to the contrary, based on the collusion hypothesis, a change in health plans that is implemented gradually and sequentially would go hand-in-hand with a reduced member rotation between the Isapres accused of collusion. Otherwise, no Isapre would be willing to move first and lead a reduction in plans since other Isapres would take advantage of this transition period to attract the clients of the Isapre that is the first to remove the 100/80 plan from the market.

In terms of transfers within Isapres not suspected of collusion and inter-group transfers, the theoretical prediction is ambiguous. Mobility within non-collusive Isapres could, in principle, decrease or increase depending on, for example, if advertising (or sales force

expenditure) were a strategic complement or substitute and the accused Isapres were reducing it as part of their collusive strategy.

Regarding the movement of members among Isapres of the two groups, the prediction is again ambiguous as it depends on an unknown "transfer technology". If, for example, the Isapres are capable of focusing their efforts on attracting clients from a certain group of Isapres, then the transfer of clients from non-collusive Isapres into the Isapres that are accused of collusion could increase. On the other hand, if this were not possible, it could be expected that mobility from non-collusive Isapres to collusive Isapres would actually fall, in the same way it would within the group of collusive Isapres.

In summary, the only theoretical prediction that can be contrasted without ambiguity is that in a scenario of strategic interaction the number of transfers between Isapres accused of collusion would increase or at least not vary, while in a collusion scenario, these transfers would fall due to an agreed-upon reduction in rivalry. All of this can be compared with the number of transfers between Isapres not accused of collusion.

In order to contrast the alternative hypotheses of competition and collusion, data on the transfer of members between the different Isapres is used. The database drawn up by Agostini et. al (2006) for empirical analysis consists of monthly information from 1999 to 2004 showing the number of transfers to and from every possible pair of Isapres.[17]

The econometric analysis focuses on the differences of mobility observed within each one of the groups and excludes inter-group transfers. To this end, the regression analysis uses the data showing movement of members among Isapres of the same group as a dependent variable.[18] The explanatory variables used in the regression, which will be explained later on with the estimation analysis, are the following:

mem_orig: number of members in the Isapre where the transfer originates
mem_dest: number of members in the destination Isapre
tot_transf: total number of transfers in the system in the period
D_Colluded*Trend: trend variable (between 1 and 72) interacted against the dummy which assumes a value of 1 if the transfers are among the collusive Isapres[19]
D_NotColluded*Trend: trend variable interacted with a dummy which assumes a value of 1 if the transfers are among non-collusive Isapres

[17] It is important to explain briefly what we are referring to by transfers to and from every possible pair of Isapres. Suppose that there were only three Isapres: A, B y C. In that case, we would have 6 monthly data: number of members that moved from A to B, from A to C, from B to A, from B to C, from C to A and from C to B. Obviously since we are working with a much greater number of Isapres, let's say N, every month we will have N * (N - 1) data on member transfers.

[18] The results do not change qualitatively if the observation of movement between both groups of Isapres is also incorporated. The results of these regressions and others that validate the robustness of the results can be requested from the authors of this paper.

[19] Just as in other regressions, we have numbered the months so that 1 corresponds to January 1999; 2 to February of 1999 and so on. Remember that inter-group transfers have been excluded from the analysis meaning this variable is equal to zero for transfers among Isapres not involved in collusion.

D_Colluded*D_Collusion: dummy variable which assumes a value of 1 if the transfers are among collusive Isapres and after period 39 (March 2002). It should be noted that ***D_Collusion*** is equal to 1 only as of April 2002
D_NotColluded*D_Collusion: dummy variable which assumes a value of 1 if the transfers are among non-collusive Isapres and after period 39
D_Colluded*D_Collusion*Trend: interacted variable which assumes the value of the trend if the transfers are between collusive Isapres from period 40 going forward and assumes a 0 value otherwise
D_NotColluded*D_Collusion*Trend: interacted variable which assumes the value of the trend if the transfers are among non-collusive Isapres from period 40 going forward and assumes a 0 value otherwise
D_VidaPlena: a dummy which assumes a value of 1 for the observation of transfers originating in Isapre Vida Plena in periods 52 to 58

The estimation was done using a panel data econometric model with fixed effects. The specification of fixed effects is confirmed with a Hausman test, where a value of 41.6 rejects the specification of random effects. It is important to note that the estimators obtained under the fixed effects specification are consistent, even in the case where the specific non-observed characteristics of each Isapre are correlated with one of the independent variables. Table 7 shows the results of this estimation.
The table shows that the regression produces a good data adjustment, with an explained variation of almost 40%, which is relatively high for panel regressions, and an F test - also high - that shows the global significance of the estimated coefficients.

The first two variables, ***cot_orig*** and ***cot_dest***, control for a fundamental aspect which has to do with the size of the origin and destination Isapres. It is to be expected that more members leave the larger Isapres and that more members transfer to the larger Isapres. The coefficients that accompany these variables have a positive sign in the regression, as expected, and are statistically significant.

The variable of total transfers, **tot_transf**, in the system in each period controls for possible seasonality and for other variables that may affect the Isapre system as a whole. The coefficient of this variable is positive as expected and statistically different from zero.

The ***D_VidaPlena*** variable controls for a period of unusual activity that preceded Vida Plena S.A.'s bankruptcy. In the six months prior to this period, transfers from Vida Plena S.A. to other Isapres were unusually high, as is reflected in the estimated coefficient which is positive and statistically different from zero.[20]

Variables ***D_Colluded*Trend*** and ***D_NotColluded*Trend*** are the tendency variables for the collusive and non-collusive Isapre groups, respectively. Both variables are included in the regression in order to control for the fact that the Isapres within each group are inherently different, as is highlighted by the significance of the ***cot_ori*** and ***cot_des*** variables (the largest Isapres are in the group of Isapres accused of collusion). Also, the

[20] The results are robust apart from this variable.

D_Colluded*D_Collusion*Trend and ***D_NotColluded*D_Collusion*Trend*** variables capture changes in the trends of both groups as of the beginning of the collusion period.

In the case of the Isapres not accused of collusion, the trend has been positive during the whole sample period (1999-2004), but less so as of the collusion period (since April 2002). In the case of the collusive Isapres, the trend has been negative during the whole sample period, but less so (in absolute value) in the second part. A priori, this last part may seem contrary to the theoretical predictions; however it is not when the change in the level of transfers is included in the analysis.

In effect, these important changes are controlled by the coefficients of variables ***D_Colluded*D_Collusion*** and ***D_NotColluded*D_Collusion***. As such, these variables capture the changes in the level of transfers (situated at the origin) for either group. In the case of Isapres not involved in collusion, this "jump" is not significantly different from zero, but in the case of collusive Isapres it is negative, significant and of important magnitude with respect to changes in the same group's trend.

Figure 8 illustrates the "jump" that occurs in the group of collusive Isapres as of period 40 or April 2002 (dotted line), demonstrating a reduction in the number of members who transferred within Isapres accused of collusion - a clear sign of a reduction in rivalry between these companies in the period. Again, it is useful to point out that the regression includes individual effects according to the Isapre of origin, which are significant and control for non-observed characteristics specific to each Isapre. In line with this, an evolution of transfers in either group can be observed in this Figure.[21]

These results allow us to conclude that, statistically, the behavior (measured as transfers within the group) changed significantly for the Isapre group accused of collusion compared to the Isapre group that was not. In other words, the data demonstrates that there was a change in the behavior of transfers among collusive Isapres compared to non-collusive Isapres. The lower transfer rate within the colluded Isapres is neither explained empirically by a shock that affected the whole market nor by the unique characteristics of the Isapres that make up each group. For this reason, the significant change in the number of transfers at the Isapres accused of collusion is consistent with the hypothesis that those Isapres effectively followed a strategy which allowed them to reduce their market rivalry.[22] In addition, this empirical result is not consistent with the hypothesis of competition or strategic interaction between companies.

[21] The common starting point for both groups is arbitrary since the starting points depend on individual effects and on the value of other variables whose effect is neither taken into account in the Figure nor reported in the pertinent table, but which are considered in the econometric regression.

[22] Evidence that the TDLC rejected for not having been formally presented was the so-called "framework agreement". This went into effect in 2002 and, according to salespeople from the Isapres accused of collusion, consisted of not offering 100/80 plans to any potential new member and instead only offering them the 90/70 plans.

4.3 Advertising Expenditures

The reduction in rivalry can also be empirically analyzed with the measurement of directly observable strategic variables. In this section and the next, we show there was a reduction in advertising expenditures and sales force expenditures by the collusive Isapres, taking the behavior of the same variables for the non-collusive Isapres as a control.

A brief theoretical discussion is necessary, referring to expenditures in both advertising and sales force, since the strategic use of these variables is equivalent. For simplicity, the theoretical model that was developed to show incentives to collusion by using a strategy of reducing the coverage of health care plans omits the advertising and sales force variables. Without making the model unnecessarily complicated, it is logical to expect that - in a case where a large portion of Isapres are colluding - the companies would decide to reduce their sales force (advertising expenditures and sales force expenditures).

A first explanation comes from game theory. It can be expected that in strategic interaction among firms, the Isapres' "game" with respect to advertising and sales force expenditures have the structures of a "prisoner's dilemma": it is convenient for each firm to spend on advertising independent of what the others spend, but this leads all Isapres to an inefficient situation (they all lose compared to the case in which none of them make advertising expenditures).[23] In the case of collusion, they should then reduce their expenditures in these dimensions. In a case of repeated game, there are strategies of tacit collusion (for example: trigger strategies, stick and carrot, etc.) which lead the firms participating in collusion to reduce their advertising expenditures.

As well as the "prisoner's dilemma" argument, which explains how it is possible for advertising and sales force expenditures to fall during a collusive phase, it is also reasonable to expect that the companies involved in collusion would reduce their rivalry in the adjustment period. In particular, in the case that collusion does not start instantaneously but rather some Isapres do it first and require that the other members of the agreement reduce their rivalry so that dissatisfied users do not change their Isapre. One strategy that collusive Isapres can use to show their conformity with the agreement and to signal to other Isapres that the agreement can begin is to reduce advertising and sales force expenditures. Doing this will attract fewer clients away from the Isapres that have reduced the coverage in their health insurance plans.

Consistent with the theoretical prediction, we show in this and the next section that the five Isapres accused of agreeing to reduce competition effectively decreased the rivalry to capture new clients during the collusion period. In other words, the abrupt fall combined with the trend in advertising and sales force expenditures of these Isapres in 2002 allows us to claim that this happened because of a tacit agreement and not because of the strategic interdependence of these companies in their market. This conclusion is also

[23] This game is fairly standard in this literature. For references, see Gibbons (1992) or Dixit and Nalebuff (1992).

supported by the fact that such evolution in advertising and sales force expenditures was not seen in the Isapres which were not a part of the collusive agreement.

The competition and collusion hypotheses are posed in order to compare what the behavior of the advertising variable will be in these two contexts. In the private health insurance market, price competition is limited by regulations that require a minimum mandatory premium of 7% of an employee's monthly wage up to an income of 60UF (Larrañaga, 1997). Since price competition is limited, advertising then becomes an important competition tool among Isapres.

In a context in which a group of companies offer an "innovative and more efficient" product (Isapres accused of collusion argue that this is the case with their 90/70 plans), one would expect more of an effort in advertising and disseminating the new product, or at least that advertising expenditures would not change substantially. So the null hypothesis stating that variations in advertising expenditures are not negative is not sustained by the empirical evidence.

What should be expected regarding advertising expenditures in a context of collusion? One alternative is that collusion only happens at the level of deciding to change plans and in this context and because of this, advertising should not necessarily change. This alternative however, is unlikely given the sequence in which the Isapres went about modifying their plans: those that first began moving toward the 90/70 plans would have a lot to lose if the other Isapres continued with the traditional plans and "stole" clients during this transition period. Therefore, in the context of collusion we should expect a reduction in advertising expenditures starting on the date when the transition to 90/70 plans commences. Empirical evidence is consistent with this hypothesis.

A second alternative is that the collusion was more wide ranging and not just limited to the coverage of health care plans, and in this context, considering that the largest Isapres are part of the agreement, a reduction in advertising expenditures should be expected. This hypothesis is supported by arguments based on models like the prisoner's dilemma set out above.

In order to contrast the two hypotheses (competition versus collusion) a lineal regression model is estimated with the variable Quarterly Expenditure on Real Advertising for each Isapre as the dependent variable and the following explanatory variables:

Trend: Quarterly trend variable (1, 2,…, 24)
D_Colluded*Trend: Interaction or multiplication of the *Trend* variable with the dummy which assumes the value of 1 for collusive Isapres, *D_Colluded*. So, this interacted variable measures the advertising expenditure trend for the Isapres accused of collusion by the antitrust agency
D_AdCollusion: Dummy variable equal to 1 for all the Isapres as of the second quarter 2002 (note that it only differs from *D_ProfCollusion* in quarters 2 to 4 of 2002)
D_AdCollusion*Trend: Interaction between the previous variable and *Trend*

D_Colluded*D_Collusion: Dummy variable equal to 1 as of the second quarter 2002 for collusive Isapres
Set of continuous **dummy variables** equal to 1 for the Isapre as of the moment of a merger (for example, the *du_INGSalu~a* variable assumes a value of 1 only for Isapre ING Salud as of its merger with Cigna)

The estimation of the model was done using panel data with fixed effects. The results are summarized in Table 8. In this case, the ***Trend*** variable captures market trends - if there be any - regarding advertising expenditures made by the Isapres not accused of collusion (the trend of collusive Isapres is controlled by the other dummy variables already mentioned). For collusive Isapres, the ***D_Colluded*Trend*** variable captures any difference in their trend as compared to that of non-collusive Isapres. The results show that the estimated coefficient for ***Trend*** is not significant at 5%. That is, the non-collusive Isapres keep their advertising expenditures constant during 1999 to 2004.[24] On the other hand, the estimated coefficient of ***D_Colluded*Trend*** is negative and significant, which shows that advertising expenditures for the collusive Isapre group started decreasing before the collusive period began.

Also, the ***D_AdCollusion*** variable assumes a value of 1 for all the Isapres during the collusive period. If something would have happened that affected the level of advertising expenditures for all the Isapres as of the second semester 2002, the coefficient of this variable should capture it. In the regression, this controls for any change or market shock that caused changes in advertising expenditures for all the Isapres. Even so, the estimated coefficient is statistically non-significant, which tells us that there was no shock from 1999 to 2004 that affected advertising expenditures in the market as a whole.

The ***D_AdCollusion*Trend*** and ***D_Colluded*D_AdCollusion*** variables capture whether the collusive Isapres' behavior was different from that of the other Isapres since 2002. The first of these variables captures a change in the advertising expenditure trend and the second captures a change in the "level" of these expenditures. It is interesting to see that both coefficients are statistically significant. Note that the value for the trend variable's coefficient in the period of collusion is similar (with the opposite sign) to the general trend for collusive Isapres, which means that the trend of lower advertising expenditures stopped (as a matter of fact it is slightly positive). But on the other hand, the coefficient that captures a change in the level of advertising is negative, significant and of considerable magnitude.

This indicates, without ambiguity, that as of the second semester 2002 there was a significant drop in the advertising expenditures of Isapres accused of collusion, which did not happen of non-collusive Isapres, and which has continued to be low since then. What is important in this result is that it statistically confirms reduced competition through

[24] In other specifications, the coefficient is significant at 5% and with values similar to that in the regression already presented in the text. Taking this coefficient as positive would only reinforce the results laid out here. These other specifications can be requested from the authors.

advertising among collusive Isapres and this change is not due to a shock that affected the whole market.

In effect, it is important to point out that the difference in behavior between the groups of collusive and non-collusive Isapres is not due to the unique and individual characteristics of the Isapres that make up the two groups since these effects are controlled by the fixed effects of the regression. Consequently, the drop in advertising expenditures experienced by the five Isapres accused of collusion can neither be explained by strategic interaction among companies nor by market reasons.

Figure 9 shows the "average" behavior of both Isapre groups as predicted by the estimates. The evolution of advertising expenditures at either group can be compared using the Figure, but not the level of expenditures since individual effects have not been included in the Figure.

4.4 Sales Force Expenditures

In order to check how robust the previous results are, the same sort of analysis that was performed on advertising can be carried out on sales force expenditures. To this end, none of the definitions for the previous variables, the detailed analysis, the theoretical discussion, nor the presentation of the alternative hypotheses drawn up in the previous section are repeated.[25] We only show the empirical results.

According to the econometric analysis, the behavior of sales force expenditures at open Isapres, both collusive and non-collusive, is similar to that shown by the advertising expenditures. The findings are summarized in Table 8 and in Figure 10.

5. Conclusions

This paper empirically shows that the five Isapres accused by the national antitrust prosecutor FNE of practices aimed at reducing competition did indeed engage in these practices. The evidence found is robust enough to support the claim that these companies reduced their levels of rivalry at the exact same time they began changing their health insurance plans.

We proceeded in accordance with the conscious parallelism doctrine and show evidence of several “plus factors” that allowed us to distinguish between the hypotheses of competition and collusion.

When Isapres decide to market a new plan that is allegedly more efficient and convenient for their customers, there is no reason under a competition hypothesis why they would lower their advertising and sales force expenditures, why the transfer rate of customers within the "innovative" Isapres would decrease or why the profits of both the accused and non-accused Isapres would rise.

[25] The variable SfCollusion in Table 8 is equal to 1 for all the Isapres as of the second quarter 2002.

These four factors are perfectly consistent with a collusion hypothesis and were empirically demonstrated: the operating margin rate of all Isapres increased once the transition period to reduce plan coverage was over. We tested if the OMR of colluded Isapres increased more than it did at non-colluded ones (as one could expect in any cartel), but the associated coefficient was (negative and) not significant. There was a significant change in the level of advertisement and sales force expenditures for the group of colluded Isapres (and not for the other group) by the time plans had begun to be substituted. Finally, and this is very likely the most important evidence as it abstracts away from any particular modeling assumption on how Isapres compete, the rate at which the colluded Isapres attracts customers away from each other significantly decreased (as compared with the non colluded ones) by the time coverage was reduced.

In July 2007 the Chilean Competition Court (TDLC) ruled that there was not enough evidence and declared the five Isapres not guilty (although two judges, out of five, voted for conviction). In January 2008 the Supreme Court of Justice, again in a non-unanimous decision, upheld the TDLC's ruling.

References

Aedo, C. y C. Sapelli (1999), "El Sistema de Salud en Chile: Readecuar el Mandato y Reformar el Sistema de Seguros", *Estudios Públicos* 75: 189-227.

Agostini, C., E. Saavedra y M. Willington (2006), "Colusión en el Mercado de Isapres. Un Análisis de Competencia", Technical Report presented before the Tribunal de Defensa de la Libre Competencia.

Asociación de Isapres A. G. (2006), "Competencia Desleal", mimeo www.isapres.cl (January 20th, 2006).

Arrow, K. (1963), "Uncertainty and the Welfare Economics of Medical Care", *American Economic Review* vol. 53: 941-973.

Bain, J. (1956), Barriers to New Competition, Harvard University Press.

Baker, J. (1993), "Two Sherman Act Section 1 Dilemmas: Parallel Pricing, the Oligopoly Problem, and Contemporary Economic Theory", *Antitrust Bulletin* 38: 143-219.

Biggs, A. y P. Klemperer (1992), "Multi-period Competition with Switching Costs", *Econometrica*, vol. 60(3): 651-666.

Chamberlin, E. (1933), The Theory of Monopolistic Competition, Harvard University Press.

Diamond, P. (1992), "Organizing the Health Insurance Market", *Econometrica*, vol. 60: 1233-1264.

Dixit, A. y B. Nalebuff (1992), Thinking Strategically, Norton (en español: Antoni Bosh, 1994).

Ferreiro, A., E. Saavedra y G. Zuleta (2004), "Marco Conceptual para la Regulación de Seguros de Salud", División de Programas Sociales, Inter American Development Bank (available at http://www.iadb.org/regions/re1/econ/RE1-04-006.pdf, 29/12/05).

Friedman, J. (1971), "A Noncooperative Equilibrium for Supergames", *Review of Economic Studies* vol. 28: 1-12.

Gibbons, R. (1992), Game Theory for Applied Economists, Princeton University Press.

Jacquemin, A. (1987), The New Industrial Organisation, MIT Press.

Jacquemin, A. y M. Slade (1989), "Cartels, Collusion and Horizontal Merger", en R. Schmalensee y R. Willig eds., Handbook of Industrial Organisation, North Holland.

Klemperer, P. (1987), "The Competitiveness of Markets with Switching Costs", *RAND Journal of Economics*, vol. 18(1): 138-150.

Klemperer, P. (1995), "Competition When Consumers Have Switching Costs: An Overview with Applications to Industrial Organization, Macroeconomics, and International Trade", *Review of Economic Studies*, vol. 62(4): 515-539.

Kovacic, W. (1993), "The Identification and Proof of Horizontal Agreements Under the Antitrust Laws", *Antitrust Bulletin* vol 38: 5-82.

Larrañaga, O. (1997), "Eficiencia y Equidad en el Sistema de Salud Chileno", CEPAL, Serie Financiamiento del Desarrollo Nº 49.

Lopatka, J. (1996). "Solving the Oligopoly Problem: Turner's Try", *Antitrust Bulletin* vol. 41: 843-908.

Posner, R. (1976), Antitrust Law, University of Chicago Press.

Sapelli, C. y A. Torche (1997), “El Seguro Provisional de Salud: Determinantes de la Elección entre Seguro Público y Privado, 1990-1994”, *Cuadernos de Economía* 106: 383-406.

Shapiro, C. (1989), “Theories of Oligopoly Behaviour”, in R. Schmalensee y R. Willig eds., Handbook of Industrial Organisation, North Holland.

Stigler, G.J. (1968), “Barriers to Entry, Economies of Scale and Firm Size”, in G. Stigler ed., The Organization of Industry, Irwin, 67-70.

Tirole, J. (1988), The Theory of Industrial Organization, MIT Press.

Titelman, D. (1999). “Reformas al Financiamiento del Sistema de Salud en Chile”, *Revista de la Cepal* vol. 69: 181-194.

Turner, D. (1962). “The Definition of Agreement Under the Sherman Act: Conscious Parallelism and Refusals to Deal”, *Harvard Law Review* 75: 655-706.

Table 1. Fraction of Users in Isapres by Income Decile and Age

		Less than 20	Between 20 and 40	Between 40 and 60	More than 60
Income Decile	1	1,2%	1,1%	1,4%	1,1%
	2	1,9%	2,0%	2,0%	0,9%
	3	4,9%	4,9%	3,5%	1,1%
	4	8,2%	7,8%	6,1%	1,5%
	5	12,1%	10,5%	9,5%	1,4%
	6	16,8%	14,2%	12,0%	2,9%
	7	27,3%	20,7%	16,8%	6,6%
	8	37,6%	30,6%	26,7%	8,5%
	9	52,7%	43,3%	37,2%	16,1%
	10	73,0%	64,6%	59,7%	38,2%

Table 2. Fraction of Users by Income Decile and Health Status

		Very Good	Good	Regular	Bad	Very Bad	Do not Know
Income Decile	1	3,5%	1,5%	0,8%	0,9%	0,3%	0,7%
	2	3,1%	1,8%	1,9%	1,5%	0,6%	0,0%
	3	5,9%	3,5%	3,0%	1,3%	2,2%	3,1%
	4	9,5%	7,5%	4,0%	0,4%	2,9%	2,4%
	5	11,3%	10,2%	5,2%	5,2%	6,1%	7,5%
	6	16,6%	13,0%	6,0%	5,9%	6,2%	27,1%
	7	24,3%	18,8%	10,2%	9,1%	2,2%	7,1%
	8	25,9%	27,8%	15,8%	13,9%	18,7%	21,2%
	9	41,6%	36,4%	24,9%	15,3%	0,5%	58,3%
	10	65,1%	58,2%	42,5%	28,3%	1,9%	58,2%

Table 3. Estimated Probability of Choosing Isapres

Variable	Elasticity	Standard Error	Z test
Sex	0,0447783	0,01256	3,56
Age	2,099982	0,26774	7,84
Age^2	-1,499337	0,15357	-9,76
Household Autonomous Income	0,3798256	0,01417	26,8
Number of People in the Household	-0,4510951	0,03426	-13,17
Good Health Status	0,3860437	0,02952	13,08
Bad Health Status	-0,0149405	0,00702	-2,13
N	90030		
LR Chi^2	1527		
Prob > Chi^2	0,0000		
Pseudo R^2	0,1469		

Table 4. Distribution of Consumers between Isapres and Public Health Insurance by Income Decile

		Fraction of People in	
		Isapres	Fonasa
Income Decile	1	1,2%	91,8%
	2	1,9%	90,5%
	3	4,2%	87,6%
	4	7,0%	83,0%
	5	9,7%	79,4%
	6	12,9%	73,1%
	7	19,7%	65,3%
	8	28,3%	55,6%
	9	40,3%	41,7%
	10	61,6%	24,5%

Table 5. Reaction Functions

$x_a = \frac{R-t}{2pL} + \frac{1}{4}(x_b + x_l)$	$x_b = \frac{R-t}{2pL} + \frac{1}{4}(x_a + x_c)$	$x_c = \frac{R-t}{2pL} + \frac{1}{4}(x_b + x_d)$
$x_d = \frac{R-t}{2pL} + \frac{1}{4}(x_c + x_e)$	$x_e = \frac{R-t}{2pL} + \frac{1}{4}(x_d + x_f)$	$x_f = \frac{R-t}{2pL} + \frac{1}{4}(x_e + x_g)$
$x_g = \frac{R-t}{2pL} + \frac{1}{4}(x_f + x_h)$	$x_h = \frac{R-t}{2pL} + \frac{1}{4}(x_g + x_h)$	$x_i = \frac{R-t}{2pL} + \frac{1}{4}(x_h + x_j)$
$x_j = \frac{R-t}{2pL} + \frac{1}{4}(x_i + x_k)$	$x_k = \frac{R-t}{2pL} + \frac{1}{4}(x_j + x_l)$	$x_l = \frac{R-t}{2pL} + \frac{1}{4}(x_a + x_k)$

Table 6. Operating Margin Rate

Variable	**Coefficient**	**Standard Error**
Trend	**-0,008***	(0,0033)
D_ProfCollusion	**-0,183***	(0,0724)
D_ProfCollusion*Trend	**0,015***	(0,0048)
D_ProfCollusion*D_Colluded	**-0,012**	(0,0188)
Constant	**0,325***	(0,0376)
Quarterly Fixed Effects	yes	
Isapres Fixed Effects	yes	
R^2	0,3512	
F	30,71	
N	317	

* : significant at 5%.

Table 7. Transfer of Members among Isapres

Variable	Coefficient	Standard Error
Mem_orig	**0,0026252 ***	(0,00011)
Mem_dest	**0,0009381 ***	(0,00002)
tot_tras	**0,004195 ***	(0,00043)
D_VidaPlena	**172,57 ***	(17,99494)
D_Colluded*Trend	**-5,299 ***	(0,40021)
D_NotColluded*Trend	**2,464 ***	(0,31270)
D_Colluded*D_Collusion	**-84,398 ***	(26,21061)
D_NotColluded*D_Collusion	**14,675**	(20,96496)
D_Colluded*D_Collusion*Trend	**3,687 ***	(0,56470)
D_NotColluded*D_Collusion*Trend	**-0,957 ***	(0,45799)
Constant	**-258,79 ***	(17,86012)
Monthly Fixed Effects	no	
Source Isapre Fixed Effects	yes	
R^2	39,24 %	
F	455,92	
N	7.088	

*: significant at 5%.

Table 8. Marketing Expenses

Variable	Coefficient	Standard Error
Trend	**7,489**	(8,5288)
D_Colluded*Trend	**- 37,190 ***	(15,3275)
D_AdCollusion*Trend	**41,899 ***	(20,811)
D_Colluded*D_AdCollusion	**- 772,091 ***	(350,497)
D_AdCollusion	**29,559**	(0,0724)
Constant	**467,469 ***	(56,110)
Quarterly Fixed Effects	no	
Isapres Fixed Effects	yes	
R^2	0,1499	
F	5,06	
N	314	

*: significant at 5%.

Table 9. Sales Force Expenses

Variable	Coefficient	Standard Error
Trend	**- 27,27**	(18,850)
D_Colluded*Trend	**- 107,90 ***	(47,3474)
D_SfCollusion*Trend	**231,63 ***	(70,973)
D_Colluded*D_SfCollusion	**- 3.724,71 ***	(1.129,972)
D_SfCollusion	**-47,14**	(390,518)
Constant	**5.278,63 ***	(178,538)
Quarterly Fixed Effects	No	
Isapres Fixed Effects	Yes	
R^2	0,4214	
F	20,91	
N	314	

* : significant at 5%.

Figure 1: Relative Shares of Health Insurance Systems

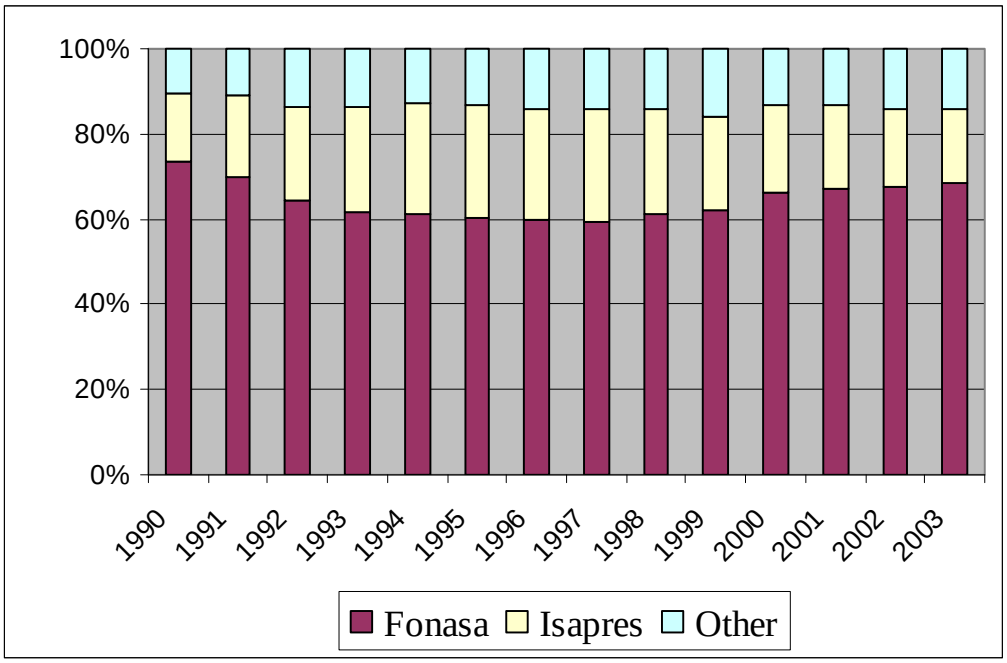

Figure 2. Share of Consumers in Fonasa and Isapres (by age)

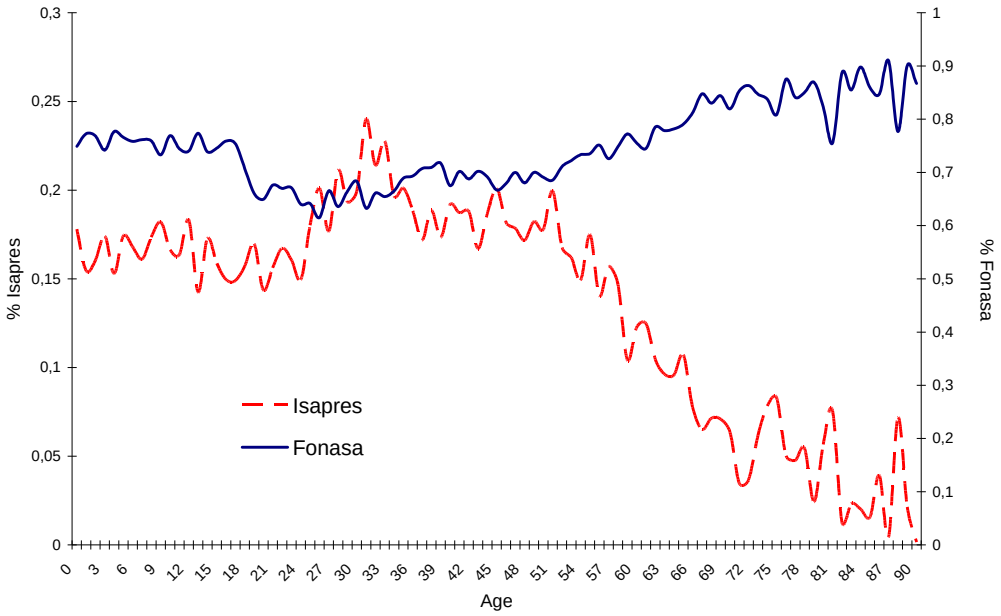

Figure 3. Predicted Probability of being in Isapre (by age, gender and health status)

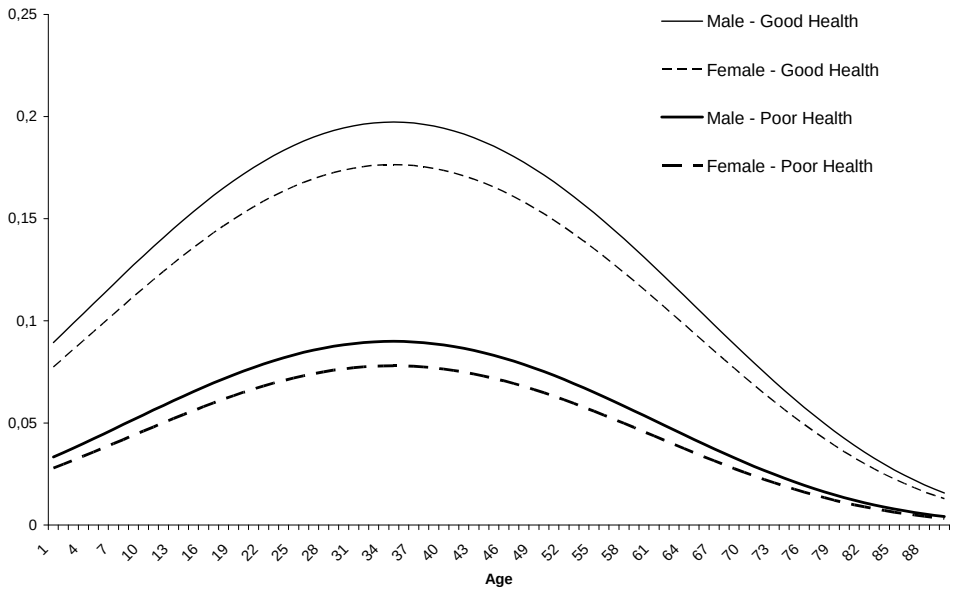

Figure 4a). Affiliation by Age for the 10th Decile

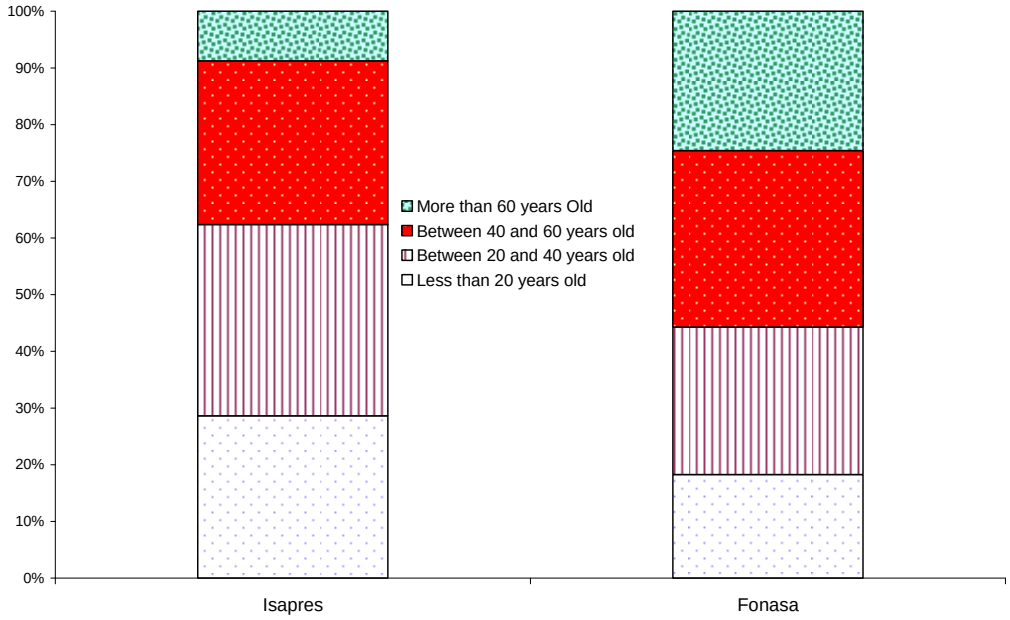

Figure 4b). Affiliation by Health Status for the 10th Decile

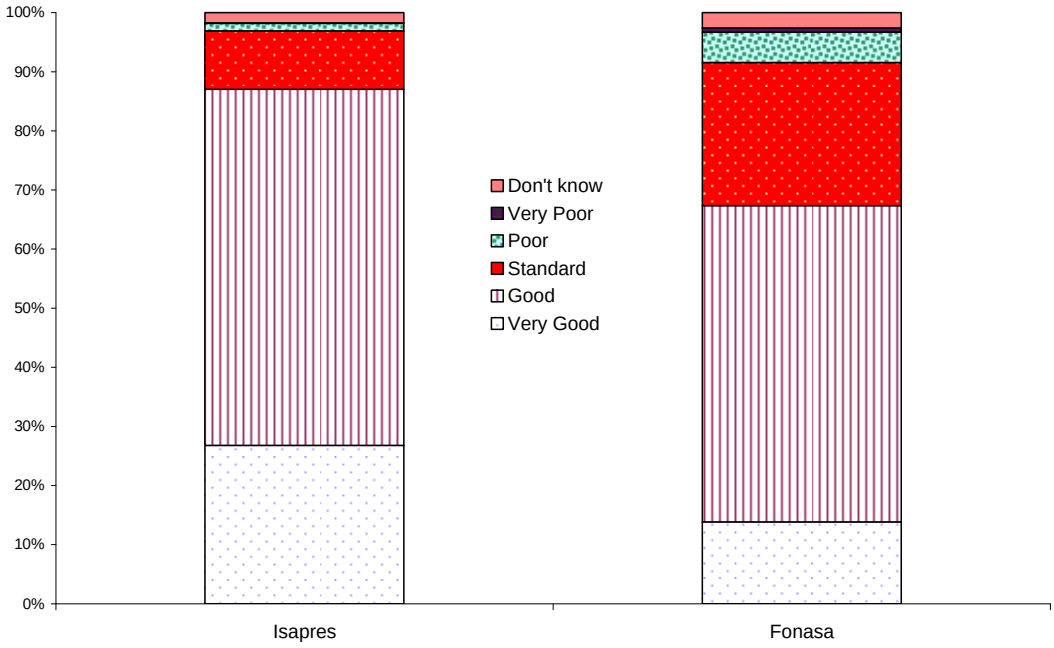

Figure 5: Market Share of a Hypothetical Entrant

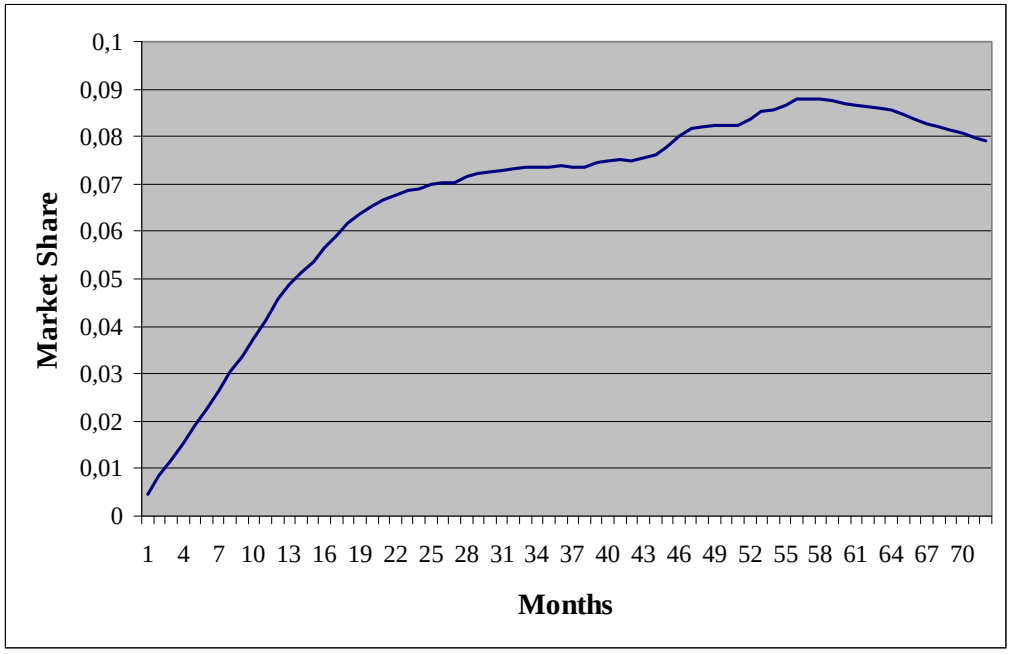

Figure 6: Margin Rate Colluded Isapres

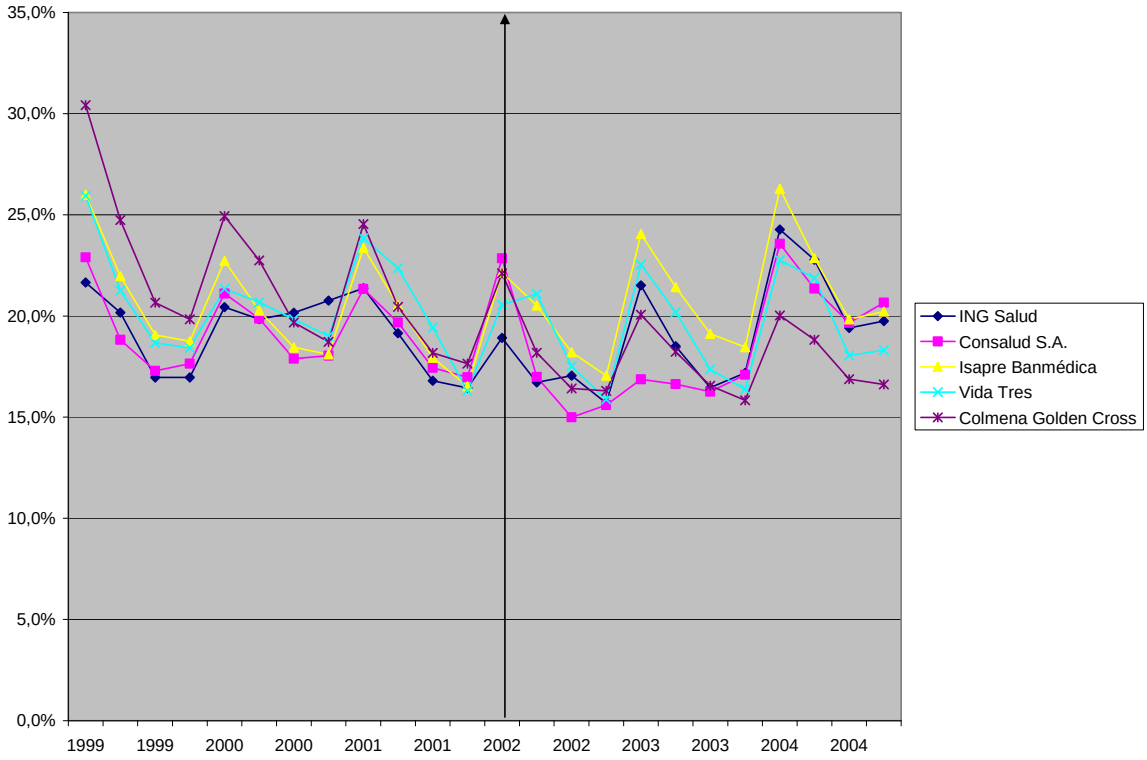

Figure 7. Operating Margin Rate

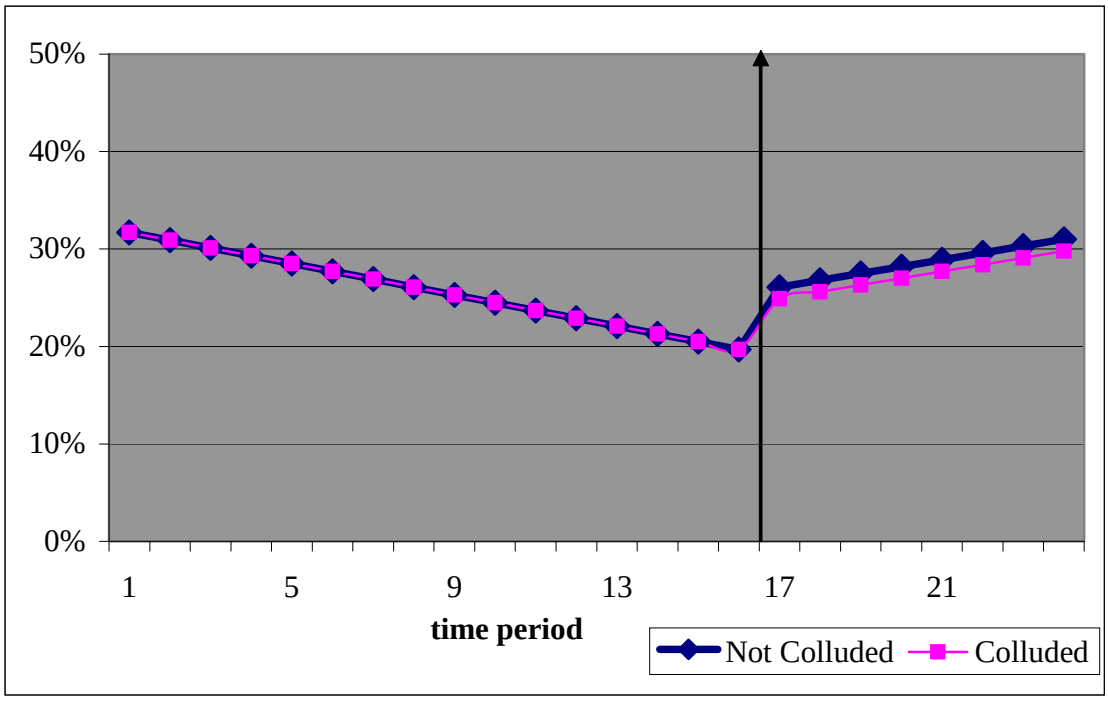

Figure 8. Transfers whitin Colluded and Not Colluded Isapres

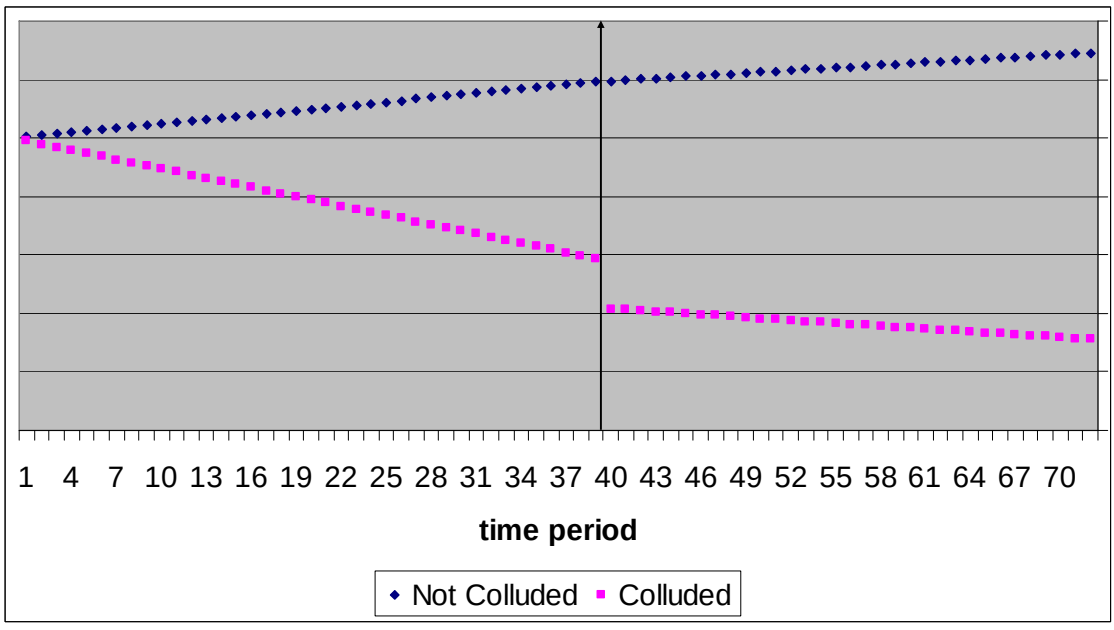

Figure 9. Marketing Expenses

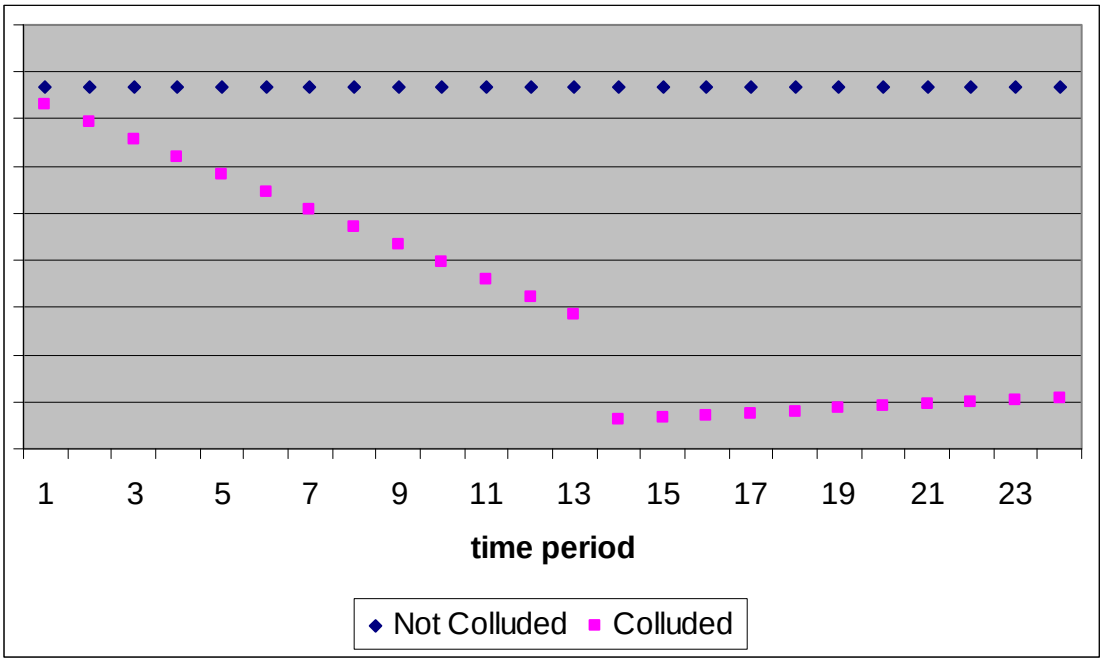

Figure 10: Sales Force Expenses