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Improving the competitiveness of the financial sector in Chile RG-T3555, RG-T3309[1]

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Executive Summary

(To be done)

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Chapter I: Methodology

The mandate we received is

i To explore how the interconnections between the financial and non-financial sectors in Chile enhance or jeopardize an effective allocation of financial resources. In particular, the study should consider the role of large conglomerates in Chile that have a presence in the financial and real sectors, which may hinder the development of a more competitive market. More specifically, the report should address how the current degree of competition in Chile's financial sector may be limiting competition in the broader economy.

ii. To investigate what role regulatory barriers to entry might play in preventing competition in the financial sector, considering that the removal of bottlenecks may enhance competition and therefore promote growth. The study should pay special attention to barriers to entry in two areas: (a) financial service platforms and (b) open banking.

iii. Based on the previous findings, provide valuable and concrete proposals that contribute to enhancing competition in the financial sector. The proposals should identify specific regulatory and non-regulatory barriers and how can they be modified to foster the entry of new players. A regional vision or recommendations to a regional level are also expected

To fulfill this mandate, our analysis will be divided into two main sections that, for lack of better words, WE will define as Financial Markets and Conglomerates.

1. Financial Markets

This analysis will focus on the main segments of the Chilean financial markets:

a) Pension Funds
b) Asset management
c) Bank Deposit
d) Credit Cards debt
e) Consumer lending
f) Mortgage lending

g) Commercial lending

For each of these segments, we will conduct the following analyses

1. *Definition of the market*

Discussion of the market definition.

2. *Prices and Quality*

2.1 Price Level

Identify comparable products and study the cross section and time series variability of prices

2.1 Quality

Identify possible quality differences that might explain differences in prices

2.2 International Comparison

In financial markets many prices are expressed in terms of percentages (commissions for asset management, interest rates, spreads, etc.). Thus, these prices are easily comparable at the international level. Thus, to the extent data are available, we will compare the prices of financial services in Chile with the prices prevailing in the major developed markets.

3 Concentration Measures

Traditional concentration measures, such as C3, C5, and Herfindahl-Hirschman Index (HHI). Comparison with similar measures of main developed markets present in the literature.

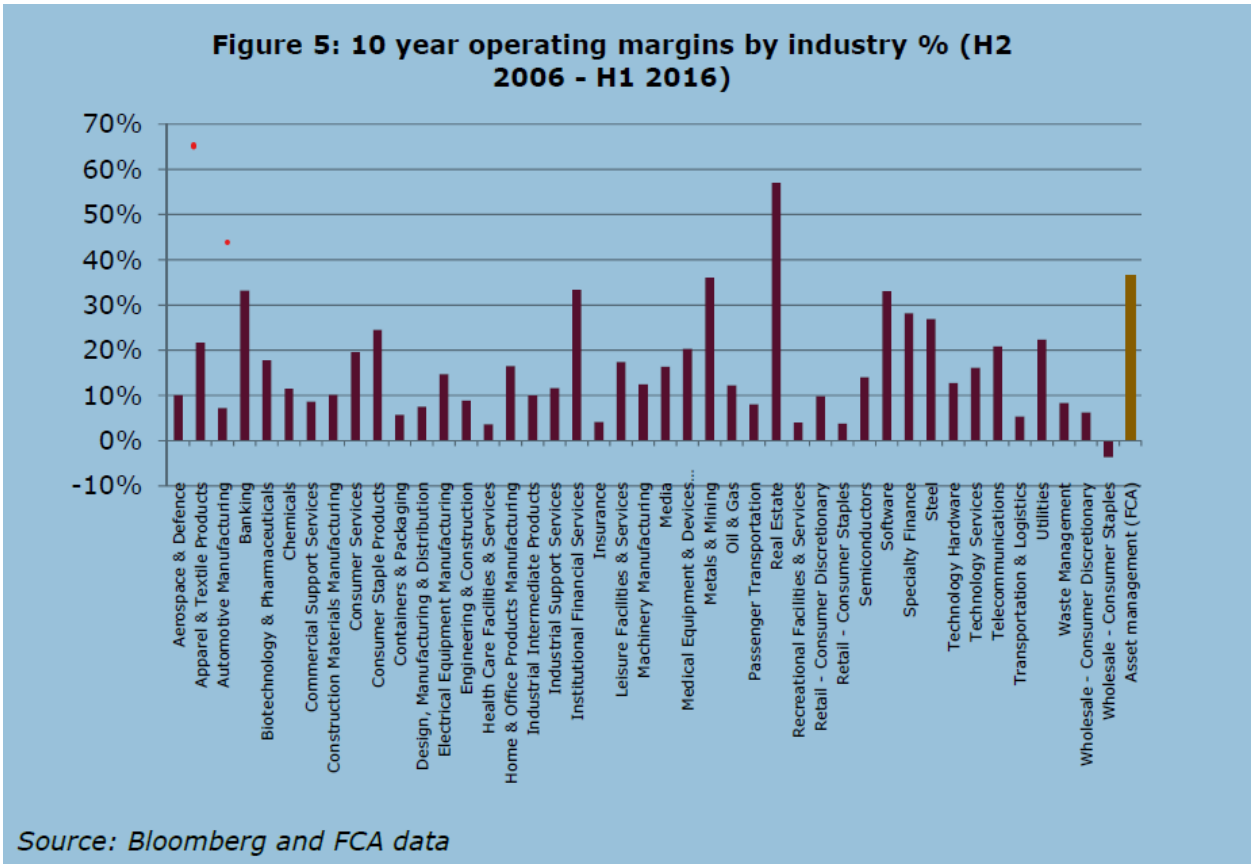
4 Competition measures

Where the data available allow, we will complement the traditional market structure measures with more meaningful competition measures, such as the Lerner index (price over marginal cost).

5 Profitability

As the British Financial Conduct Authority states in one of its industry studies: “The rationale of profitability assessment lies in economic theory; in a perfectly competitive market, prices should

reflect an efficient level of cost plus a reasonable profit, when considered for a sustained period of time." [2] We report here the analysis of the operating margins of all FTSE All Share index conducted by the FCA in the United Kingdom and contained in that report.



The feasibility of this analysis, however, depends crucially on the organizational structure prevailing in each market (and of course on the availability of data). In the case of single-product firms, like the Chilean pension funds (AFP), this task is easy. AFPs produce only one financial service and they disclose regularly their financial statements, so it is easy to measure the profitability they achieve in a single market. For other services (think for example of consumer credit), most firms producing these products are multi-product forms and their financial disclosure is limited to the aggregate, thus it is not possible compute the profitability by product.

All too often for lack of better data, the Lerner Index ends up coinciding with a measure of operating margins. Thus, we will start comparing the operating margins with what is typical in the industry in other countries.

[2] https://www.fca.org.uk/publication/market-studies/ms15-2-2-annex-8.pdf

5.1 Cost structure

To the best of data availability, we will analyze the cost structure of the product considered.

5.2 Return on Capital invested

Another contentious issue is what is the best measure of profitability for financial services, where intangibles play an important role. The problem with intangibles is that they are quantified in the balance sheet only after an acquisition. Thus, any measure of profits over assets or over shareholders' equity is distorted by that accounting practice: firms that did a lot of acquisitions would appear less profitable than firms that did not. For this reason, the main profitability measure used for comparison is EBIT over sales. Across industries, this is a very unreliable measure, because it does not account for differences in capital invested. Yet, we are going to compare Chilean firms with European or American firms in the same line of business. Thus, to the extent there are no major differences in capital intensity across countries, this measure of profitability give us a good indicator of the difference in market power across countries.
The major weakness of this method is that market power can be present in other countries as well. Thus, homogeneity in profitability across countries does not necessarily imply competitive conditions everywhere. To address this concern, it is useful to go back to the return on capital employed and compare it with reasonable estimates of the cost of capital.

6 *Evidence of Market Power if Any and Possible Sources*

Higher prices for financial services in Chile are not necessarily an indication of a lack of competition, they could be due to a higher cost of operating in Chile or a higher regulatory burden. Similarly, high concentration is not evidence per se of market power, neither is profitability alone (could be an indicator of high levels of efficiency). Nevertheless, if none of these factors are present, one can reject with a high level of confidence that firms have significant market power. By contrast, if some or all of these factors are present, there is a legitimate concern that some firms may have market power. Aggregating these different indicators in an overall opinion is inevitably subjective, but we will rely on our professional expertise to produce the best overall assessment given the results of the previous analyses

For the segments of the financial markets where the overall assessment under point vi) does not find any evidence of market power the analysis ends here. For the segments where there

is some evidence of market power, then the question is where this market power comes from. It can come from regulatory constraints, informational frictions, some form of technological gap, or some past investments. In each of the market segments considered, an original, state-of-the-art, evaluation of the sources of market power would be a publication in a top economic journal. Thus, it is not feasible for me to do so for all the market segments in the time-framework designated. What we will do instead is to rely, whenever possible, to the existing academic evidence. Whenever such evidence is not available, we will rely on a combination of economic theory and circumstantial evidence and use our best judgement in determining what the most likely source of the market power is. We will point out where additional targeted research will provide the largest new insights.

7 Recommendations

When the summary analysis under part 6 finds the presence of significant market power, we will rely on this analysis to identify the types of intervention that could alleviate the problems identified. Our approach would be to identify the simplest method to fix the problem identified.

2. Conglomerates

One of the specificities of Chile is the presence of large conglomerates, present in many industrial sectors. Thus, an analysis of competition in financial markets cannot ignore the impact of conglomerates. The financial literature on conglomerates is relatively underdeveloped, thus there is not a standard approach to analyzing them. We focus on the largest 15-20 conglomerates and follow these steps:

i. Description

First, we will present an up-to-date picture (as up to date as the available data allows) of the structure of the main conglomerates, emphasizing where they cross in holding shares in the same companies. As we will describe momentarily, this is an important feature to analyze the possible market outcomes.

ii. Theoretical effects of conglomerate

The increase in concentration of ownership is not the only effect of conglomerates. In this part, we will review the theoretical literature on what the other effects of conglomerates on product market competition might be.

iv. Empirical Evidence

Based on the review of the literature on the topic, we will look whether there is any evidence of the effects of the distortive effects of conglomerates predicted by theory.

v. Political Power

One of the concerns of conglomerate is that the combination of their size and their spread ensure them a disproportionate influence on the political system. While there are some early attempts to measures these effects, this literature is still in its infancy. Nevertheless, we will try our best to see whether we can test for the existence of any such effect.

Chapter II. Analysis of the Pension Market

The purpose of our analysis is not to evaluate the overall performance of the Chilean pension system or its desirability vis-à-vis a public pension system. We will only analyze whether the degree of competition inside the current system is sufficient to deliver a cost-effective private form of retirement to the Chilean people. This task is complicated by the fact that the pension system is mandatory, i.e., workers do not choose whether to enroll, but they *have to* enroll, even if a not trivial fraction of them do not.[3] As a result, it does not make any sense to talk about a "free market" competitive equilibrium, because without some form of mandatory constraint the market will not exist, at least in our current form. The form of the mandate, however, greatly influences the nature of the competitive equilibrium that can emerge. To make the problem tractable, thus, we will keep the basic structure of the existing pension fund system (mandatory, private, with individual accounts, with some limitations on the type of investments to ensure proper diversification) as given and limit our inquiry to whether pension services have been offered at competitive prices and, if not, what can be done to reduce this gap.

1. Definition of the market

In general, one of the biggest challenges in determining the existence of market power is the definition of the market. If one defines the market very narrowly, concentration is very high and it is easier to claim the existence of market power. If one defines it very broadly, no industry is concentrated and no firm has market power. In the case of mandatory pension contributions in Chile, this problem does not exist. Since contributions are mandatory, other voluntary form of savings are only complement, not substitute. Thus, in this section we will limit ourselves to the mandatory part.

The mandatory pension market is easily definable not only on the demand side, but also on the supply side. The 1980 DL 3.500 establishing this market mandates that the companies managing the contributions, also known as Administradoras de Fondos de Pensiones (AFP), perform only this activity. Thus, this market is clearly defined on the supply side as well. For most of its existence (from 1981 to 2009), mandatory retirement contributions have been

[3] https://www.spensiones.cl/portal/institucional/594/w3-propertyvalue-9907.html.

intermingled with mandatory disability and life insurance. For comparison purposes, we will keep this insurance market separated.

Finally, the task of managing individual pensions can be subdivided into four: i) the collection of contributions, ii) the investment of the portfolio generated by those contributions, iii) the voting on corporate governance matters in the portfolio companies, and iv) the disbursement of the pensions. These activities do not need to be performed by the same entity. In particular, since 2001 in Chile activities i) and iv) have been outsourced to Previred, a company jointly owned by the major AFPs. This is important because these activities have different economies of scale (see section 9 of this chapter).

2. Prices

2.1 Price Level

In principle, AFPs (as all asset managers) can charge for their services in multiple ways and at multiple moments of the relationship. In general, it is useful to distinguish: i) entry fees, ii) ongoing or management fees, and iii) exit fees. These fees can be fixed regardless of the size of the contribution, proportional to the size of the contribution, or proportional to the asset under management. Pension contributions have been maintained at 10% of the salary from the beginning. While the level of these fees is not regulated by law, their structure is. Since 2009 Chilean AFPs cannot charge fixed fees but are required to charge fees as a proportion of the salaries of contributors. In addition, these fees should be uniform for all participants.

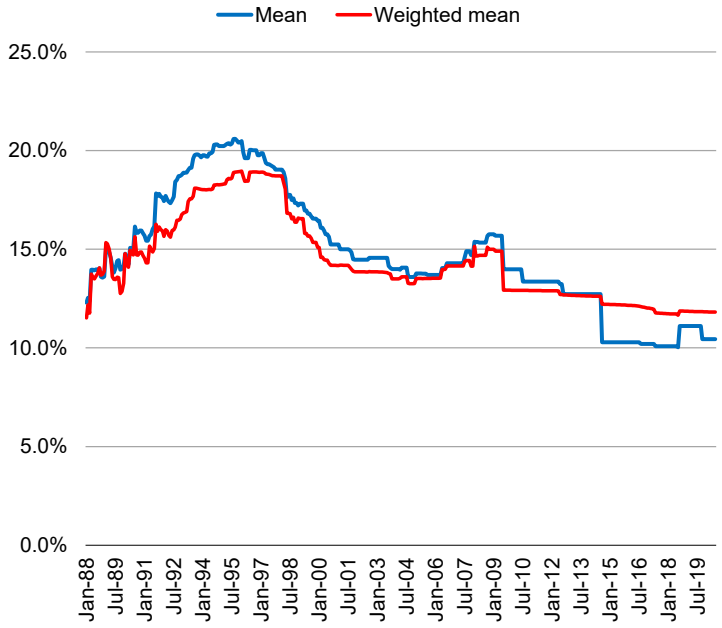
In Chile, the lion's share of AFPs' cost is represented by the up-front fee. The management fee is paid only indirectly: when AFPs delegate asset management to other institutions (e.g., foreign index funds) the cost incurred for these investments is deducted by the value of the AFP shares. The workers can annuitize their retirement payment, avoiding withdrawal fees. Yet, they end up paying more than the actuarial cost. That additional cost can be interpreted as an exit fee.

Figure II.1 shows the behavior of up-front commissions over time. The fees are generally expressed as percentage of workers' earnings. Since the contributions have remained stable at 10% of earnings throughout the entire period, there is a fixed relationship between fee as percentage of earnings and fee as a percentage of contributions. To make the fee more comparable with international analyses, we will express the fee as a percentage of contributions.

Occasionally, however, we will also report the fee as a percentage of earnings to make it easier to compare with the news regarding the bidding process. Either way, since the fees are expressed in percentage terms they do not need to be deflated to make them comparable over time.

Interestingly, the level of commissions in 2020 was pretty similar to the one prevailing in 1988, but in between, we observed two important humps. As described by Berstein (2011): "1990 began a phase of intense competition that lasted until 1997. At this stage there was an important entry of new AFPs, mergers, and acquisitions; however, the competition did not translate in greater efficiency and lower costs but, on the contrary, in high operating costs and especially commercial, which resulted in a low return on equity. This was accompanied by a high level of affiliate transfers between AFPs, which was fundamentally due to the direct remuneration that sellers gave to affiliates who changed administrators, becoming a cost not only economic for the system but also regarding its image. This stage ended in 1998 with the issuance of regulation issued by the AFP Superintendency of the time regarding the agents of sale and transfer procedure."

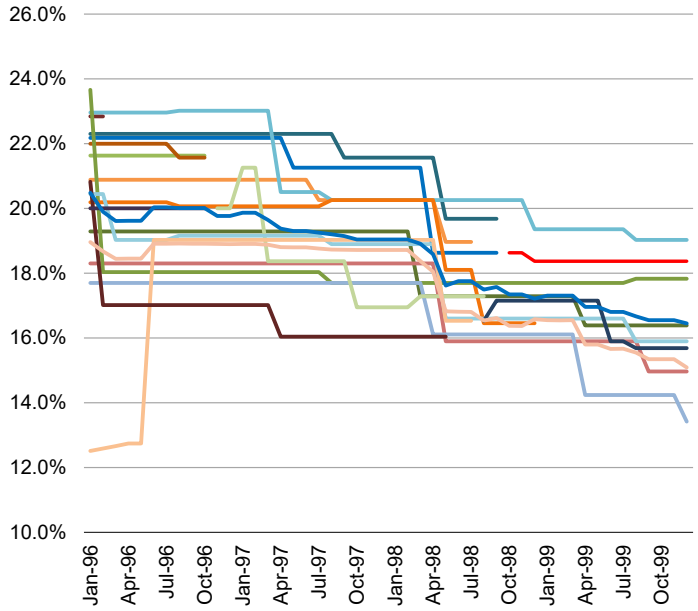
Figure II.1: Average AFP Fees as % of Contributions 1988-2020



Source: Data from Superintendencia de Pensiones

Figure II.2 shows how the introduction of the reform in 1998 led to a sudden and simultaneous decrease in commissions by many AFPs.

Figure II.2: Drop in AFP Fees as % of Contributions Around 1998 Reform

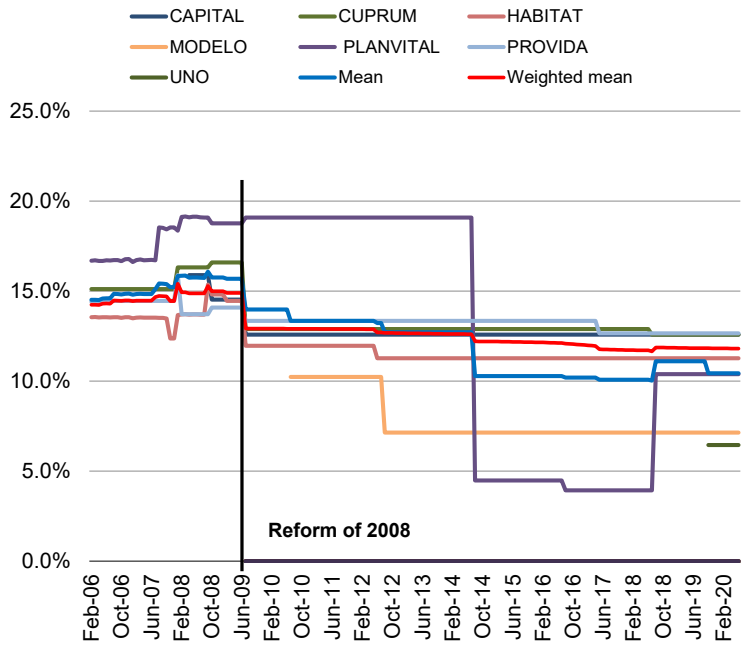


Source: Data from Superintendencia de Pensiones

The 1998 reform triggered also a consolidation phase, leading to a significant reduction in the number of AFPs present in the market. Starting in 2003 we also observe a steady rise in commissions, interrupted only by the 2008 Pension reform, which i) abolished the possibility of fixed entry fees (effective as of October 2008); ii) separated the disability and survival insurance from the pension contributions (effective as of July 2009); iii) and allocated all new workers to the lowest bidder of an auction (effective as of August 1, 2010, with the auction held in November 2009).

As Figure II.3 shows, the separation of pension and insurance fees led to a reduction of the average pension fee charged. Furthermore, in the subsequent years there was a steady downward pressure of fees, albeit this was more visible in the simple average, rather than on the value weighted one. The reason is that in 2010, for the first time since 1998, a new fund (Modelo) entered the market underbidding all the existing players in the new auction. Yet, at the beginning the assets managed by Modelo were very limited and only over time did they gain market share. Thus, the decrease in asset-weighted fee is gradual.

Figure II.3: Variations in % Commissions Around the 2008 Reform



Source: Data from Superintendencia de Pensiones

Table II.1: Fixed Entry Fees 1988-2008

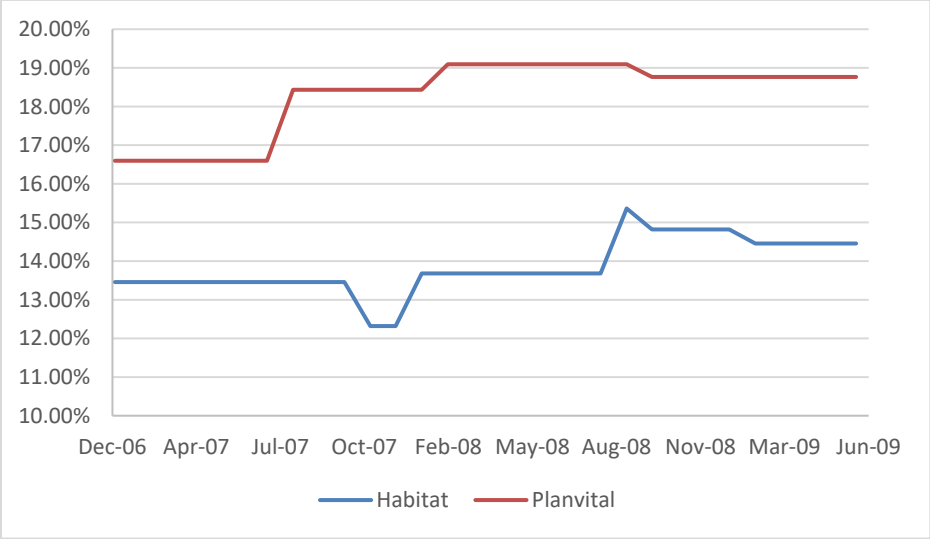
	Fixed fee in pesos			Fixed fee as % of net contribution		
	1988	**1998**	**2008**	**1988**	**1998**	**2008**
Basander		385			0.83%	
Capital			0			0.00%
Concordia	230			2.81%		
Cuprum	399	0	0	1.36%	0.00%	0.00%
El Liberado	178			1.00%		
Fomenta		480		0.00%	0.94%	
Futuro	100			0.34%		
Habitat	116	490	320	0.78%	1.81%	0.75%
Inverta	497					
Magister	270	450		1.89%	1.60%	
Modelo						
Plantivtal	298	1000	690	2.84%	4.91%	2.20%
Proteccion	116	390		0.39%	0.84%	
Provida	249	195	0	2.12%	1.04%	0.00%
SantaMaria	190	490		1.47%	2.10%	
Summa	230			1.35%		
Union	290					
Uno						
Average	243	431	202	1.36%	1.56%	0.59%

Source: Data from Superintendencia de Pensiones

Until 2008 AFP had the possibility of charging a second entry fee: an amount fixed per contribution. Table II.1 reports the value of these charges in pesos and how they relate to the average size of the contribution (which is 10% of the salary). As one can see, even before it was abolished the fixed fee was small.

Given how small and fading this component was, the behavior of the sum of these two fees is very similar to the one of the proportional entry fee alone (Figure II.1). The most remarkable fact regards the behavior of the proportional fee around the time of the removal of the fixed fee (Figure II.4). Both Habitat and Planvital, the only two AFPs that were still charging fixed fees in August 2008, increased the percentage fee respectively in August and September 2008, when the abolition of the fixed fee came into effect. Habitat increased the proportional fee from 1.51% of wages to 1.74% of wages a month ahead of the elimination of the fixed fee and then decreased it slightly to 1.69% the following January. Planvital increased the proportional fee from 2.14% of wages to 2.31% exactly at the time the fixed charge was eliminated. Summing the two components, we find that when legislation eliminated the fixed fee, Habitat increased the overall fees from 13.7% of contributions to 14.5%, while Planvital reduced it from 19.1% to 18.8%. If we consider the reduction in fee as an excise tax, the response of prices is respectively -1.2 and 0.2, thus Planvital absorbs 80% of the burden of the tax, Habitat absorbed none. In fact, it increases prices 20% more than the cost of the tax. It is hard to reconcile this behavior with a perfectly competitive market, a point we will return to in Section 7 of this chapter.

Figure II.4: Variations in Total Fees around the 2008 Reform



Source: Data from Superintendencia de Pensiones

2.2 Quality

Obviously, customers do not only care about the price, they also care about quality. In the market for retirement services quality can take three important dimensions: i) performance of the investment; ii) level of advice customers receive; iii) convenience offered in contributing and withdrawing their funds.

Regarding the first dimension, there is a vast literature in finance showing that asset managers do not systematically beat the market and the only performance to persist is the negative one due to fees (Carhart, 1997). This conclusion seems to hold for Chile as well. As López and Walker (2021) show, the average return of pension funds is not statistically different from that of a benchmark composed of a combination of local equity, local fixed income, foreign equity, and foreign fixed income. If AFPs do not beat the index, why should investors pay a premium for them?

There are too few AFPs to conduct any statistical analysis of whether more expensive funds perform better in Chile. Yet, it is possible to conduct this analysis across countries. The 2019 "Pension Markets in Focus" publication of the OECD reports the long-term returns of pension funds for several countries (not just OECD ones). In addition, Han and Stańko (2020) compute a comparable cost of various pension plans known as charge ratio (see next section for explanations) in 44 countries. By merging the two datasets, we can obtain 22 countries for which both the cost estimates and the return estimates are present. As Figure II.5 shows, the relationship if anything is negative: funds perform worse in countries where they are more expensive. Given the paucity of observations, this negative slope is not statistically significant. Even if it were, it would be wrong to infer any causality. Yet, we can confidently assert that the idea that some plans are more expensive because they offer higher returns is devoid of any empirical support.

Figure II.5: Relationship between annual real return and cost of pension plan

Source: Author's calculations based on data in OECD Pension Markets in Focus 2019 and Han and Stańko (2020).

Regarding the second dimension of quality Gennaioli et al (2015) claim that investors hire money managers to help them overcome the anxiety of investing. In the case of voluntary contributions, this advising helps overcome a reluctance to invest. In the case of mandatory contributions, it helps overcome a reluctance to invest in more risky assets, which tend to be the most rewarding over the longer term. If this were the case, we should expect that more expensive AFPs can better convince their affiliates to put their money into the more risky funds. By Law, Chile has five types of funds, which differ for the allowed composite of risky assets, where A is the riskiest portfolio and E is the least risky.[4] Looking at the distribution of affiliates by fund type, however, is not sufficient, since the age distribution of affiliates is very different. In particular, after the 2008 reform, every two years the winner of the auction gets all the contributions of the new entrants to the labor force. These workers are much younger than the rest and therefore should invest in more high-risk portfolios. However, and this is unfortunate,

[4] https://www.spensiones.cl/portal/institucional/594/articles-8473_recurso_1.pdf.

this breakdown by age is not available, thus we cannot look at the distribution of affiliates by fund type controlling by age to see whether more expensive funds do indeed stir investors towards more risky finds.

Table II.2: Fee and Allocation of Assets by Type of Fund

	Fee a % of	Fraction of assets invested in fund of type				
AFP	**contributions**	**A**	**B**	**C**	**D**	**E**
Uno	6.5%	0.15	0.20	0.19	0.07	0.38
Modelo	7.1%	0.11	0.28	0.23	0.07	0.30
Plantivtal	10.4%	0.08	0.22	0.32	0.19	0.19
Habitat	11.3%	0.12	0.12	0.35	0.16	0.26
Capital	12.6%	0.11	0.12	0.31	0.20	0.26
Cuprum	12.6%	0.15	0.12	0.30	0.14	0.28
Provida	12.7%	0.09	0.13	0.37	0.24	0.16
Average		0.11	0.14	0.33	0.18	0.24

Source: Data from Superintendencia de Pensiones

Yet, a cursory look at Table II.2, which reports the allocation across the five different fund types of the seven AFPs as of July 2020, suggests that there is not an obvious relationship with the level of the fees.

Chilean AFPs do not differ much on the convenience front either, since for all funds the bureaucratic part is handled by the same company: Previred. In sum, Chilean AFPs do not appear to have systematic differences along the quality dimension. Thus, we will treat them as a homogenous product.

2.3 International Comparison

While in Chile after 2008 the bulk of the cost of pension services is represented by the up-front fee, this is not the case in many other countries, where the management fee (as a percentage of assets) plays a dominant role. Any international cost comparison, thus, needs to combine the various costs and put them on the same basis to make them comparable.

Diamond (2000) provides an easy way to combine the various costs. Consider a worker with an initial salary w_0, expected to grow at g in real terms. Let r the real return on the fund, c the contribution rate to the mandatory fund as a proportion of earnings; f the front fee as a

percentage of contributions, *m* the annual management fee levied as a proportion of the fund's assets, and *t* the proportional exit charge, then the wealth accumulated after 40 years by a worker with an initial salary equal to *w* is given by:

$$A[f,m,t,r] = [(1-f)cw_0 e^{(r-m)40}\frac{e^{(g+m-r)40}-1}{g+m-r}](1-t) \quad (1)$$

Note that the value of the initial salary w_0 can be factored out. So let's normalize the initial salary to 1. Until 2008, AFPs are also charging a fixed amount per contribution. Let *p* the fixed charge per year, then we can rewrite (1) as

$$A[f,m,t,r] = [(1-f-\frac{p}{c})ce^{(r-m)40}\frac{e^{(g+m-r)40}-1}{g+m-r}](1-t), \quad (2)$$

where we have used the normalization w_0=1.

In this context, one way to measure the total charges is the **reduction in yield,** defined as the lower return *r'* that would lead to the same wealth accumulation in the absence of any fee, or

$$A[f,m,t,r] = A[0,0,0,r'].$$

Another popular way is the **charge ratio**, defined as one minus the ratio of the accumulation net of charges to the accumulation without charges, i.e.

$$CR[f,m,t,r] = 1-\frac{A[f,m,t,r]}{A[0,0,0,r]}. \quad (3)$$

Another measure often uses is the **equivalent asset fee**, defined as the fee on assets that would generate the same accumulated capital if it was the only fee charged, More formally, *m'* such that

$$A[f,m,t,r] = A[0,m',0,r]. \quad (4)$$

Since the introduction of private pension funds in 1981, the parameter *c* has been set equal to 10%. The parameter *f* has changed over time and it differs across funds. In Chile the upfront cost *f* is generally presented as a fraction of salary, not as a fraction of the charge *c*. Thus, the statistics normally report *fc.* Yet, it is convenient to report *f* separately from *c*. Column 1 of Table II.3a reports the level of *f,* which is by far the largest component of the cost. The average across funds was 10.4% of contributions. If we weigh the fees by the amount of contributions

each fund receives, we obtain 11.2%. Thus, on average one out of every nine pesos workers contribute to their retirements goes into entry fees.

AFPs in Chile do not charge an explicit management fee. Yet, when AFPs delegate the actual asset management to other funds, like foreign funds, the price they pay is passed on to investors. Thus, if we want to compare administrative costs across countries, we need to add this component. This component is disclosed by the AFP on the Superintendent website.[5] Summing the fees paid for domestic and international assets, the total amount is 28 basis points. Finally, contributors have two options to get their money back. One is in the form of an annuity, the other is in the form of periodic withdraws (total withdrawal are prohibited). Here, we restrict our attention at the second option. On average, the withdrawal fee is 1.1% of the amount withdrawn.

Table II.3a: Different Types of Fees Charged by AFPs in 2020

AFP	Entry Fee as % of Salary	Entry Fee as % of Contribut.	Manang. Fee as % Assets	Exit Fee as % of Assets	Annual Contribut. in bn CLP	Assets managed in bn CLP
Capital	1.4%	12.6%	0.27%	1.25%	1,046	29,775
Cuprum	1.4%	12.6%	0.28%	1.25%	889	28,187
Habitat	1.3%	11.3%	0.26%	0.95%	1,557	43,812
Modelo	0.8%	7.1%	0.30%	1.20%	1,078	8,577
Plantivtal	1.2%	10.4%	0.32%	0.00%	640	5,487
Provida	1.5%	12.7%	0.29%	1.25%	1,215	36,934
Uno	0.7%	6.5%	0.25%	1.20%	0.4	173
Average	1.2%	10.4%	0.28%	1.0%	6,425	152,944
VW aver	1.3%	11.2%	0.28%	1.1%		

Source: Data from Superintendencia de Pensiones

Plugging these values in equation (1) we obtain the charge ratio and the equivalent asset fee for the various Chilean AFPs and for the system as a whole. These relationships are nonlinear, thus the charge ratio and the equivalent asset fee are a function of the assumptions we make on the real rate of growth of salary and the real return on investment and the time horizon. Tables II.3b and II,3.c report the charge ratio and the equivalent asset fee for different reasonable assumptions on the real rate of growth of salary and the real return on investment. The

[5] https://www.spensiones.cl/portal/institucional/594/articles-14394_recurso_2.pdf

investment horizon is kept fixed at 40 years, which is the most relevant horizon for the majority of workers.

Table II.3.b: Charge Ratios of Chilean AFPs in 2020

	Hypotheses on salary growth and real return			
Fund	g=3% r=5%	g=2% r=5%	g=2% r=3%	g=1% r=3%
Capital	18.8%	19.0%	18.5%	18.8%
Cuprum	18.9%	19.2%	18.6%	18.9%
Habitat	17.1%	17.4%	16.8%	17.1%
Modelo	14.2%	14.6%	13.9%	14.2%
Plantivtal	16.6%	16.9%	16.2%	16.6%
Provida	19.2%	19.5%	18.9%	19.2%
Uno	12.6%	12.9%	12.3%	12.6%
Average	16.8%	17.1%	16.5%	16.8%
VW average	17.4%	17.7%	17.1%	17.4%

Source: Author's calculations based on Table 3.a.

As Table II.3b shows, the different assumptions on the rate of growth do not make a great deal of difference. On average, more than one-sixth of the accumulated wealth is eaten in commissions. The within-fund variability is quite important. Per given performance, a worker who picks Uno will be 7% richer at the end of his working life than one who chooses Provida.

Table II.3c reports the equivalent asset fee for the various AFPs and the system overall. Even in this case, the hypothesis on future growth rates of salaries and assets is not very relevant. Expressed as a function of assets under management, the average cost of the Chilean system is between 91 and 96 basis points, depending on the assumptions on the future path of salaries and real return.

Impavido et al. (2010) compute a simpler indicator of the level of fees, given by the ratio of the total income received by the pension industry divided by the total amount of assets under their management. In a system that charges fees based on earnings rather than assets under management, pension funds' income will be higher during the early phases of the system, when the number of new entrants exceeds the number of older workers in the system. It will also be

higher when the working population is growing fast. Thus, the Diamond method is preferable to compare different systems, yet the Impavido et al.'s method has simplicity on its side.

Table II.3c: Equivalent Asset Fee of Chilean AFPs in 2020

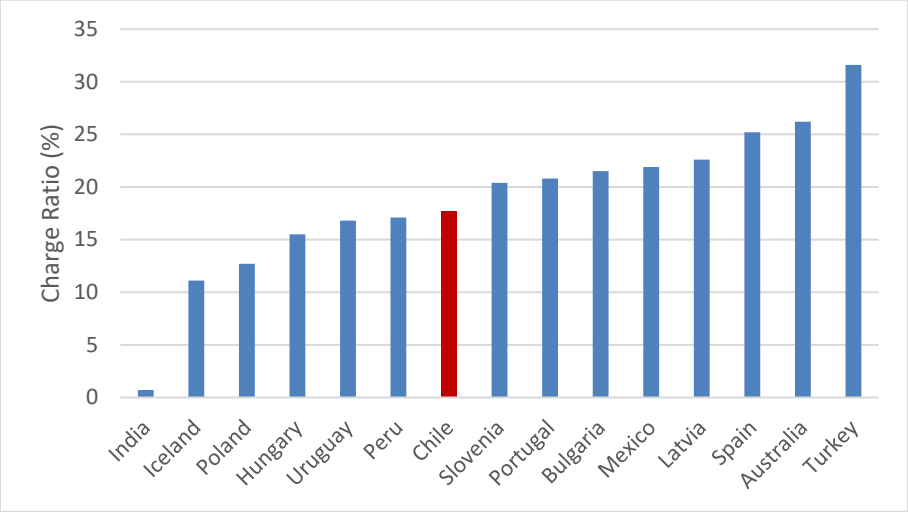
	Hypotheses on salary growth and real return		
Fund	g=3% r=5%	g=2% r=3%	g=2% g=2.5%
Capital	0.94%	0.99%	1.01%
Cuprum	0.95%	1.00%	1.02%
Habitat	0.85%	0.89%	0.89%
Modelo	0.69%	0.72%	0.73%
Plantivtal	0.82%	0.85%	0.87%
Provida	0.97%	1.01%	1.04%
Uno	0.61%	0.63%	0.64%
Average	0.83%	0.87%	0.89%
VW average	0.91%	0.95%	0.96%

Source: Author's calculations based on Table 3.a.

We are now in the position to make comparisons with other countries. Han and Stańko (2020) use data of the International Organization of Pension Supervisors (IOPS) to compare the charge ratio across countries. IOPS includes most countries with a Defined Contribution (DC) pension system with the exception of Sweden. As we will argue momentarily, Sweden is a country where the cost of DC plans is very low. Thus, we should keep this omission in mind in interpreting the results. One major difference across DC plans is whether they are based on a person occupation (occupational plans) or not (personal plans). Occupational plans tend to be significantly cheaper. For example, the charge ratio of the Australian occupational plan is only 13%, while the personal plan is 26%. Chile has a personal plan, so we will restrict our attention to the 15 countries with personal plans.

Figure II.6 reports Han and Stańko (2020) calculations of the charge ratio, as defined in (3), for those plans. Han and Stańko (2020) calculations refer to the year 2016 or 2017. They assume a salary growth rate of 2% and a real return of 3%. Their charge ratio for Chile at the 40-year horizon is 17.7%, very similar to the one we calculated above (17.1%). This level puts Chile a bit below the international median (18.8%) and the mean (20.4%).

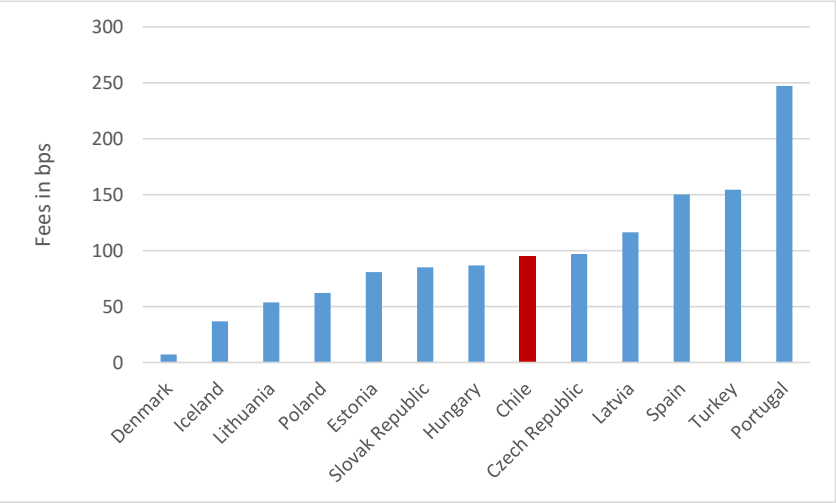
Figure II.6: Charge Ratios in DC Personal Pension Plans around the World



Source: Han and Stańko (2020).

The Organization for Economic Co-operation and Development (OECD) collects pension data for its members available at https://stats.oecd.org. As of the beginning of April 2021, the data are not available for all of the countries. Out of the 37 members, 10 did not have personal DC pension plans. Of the remaining 27, the OECD has data for the investment and administrative costs as a function of assets for 12, not including Chile.

Figure II.7: Equivalent Asset Fee of DC Personal Pension Plans (in basis points)

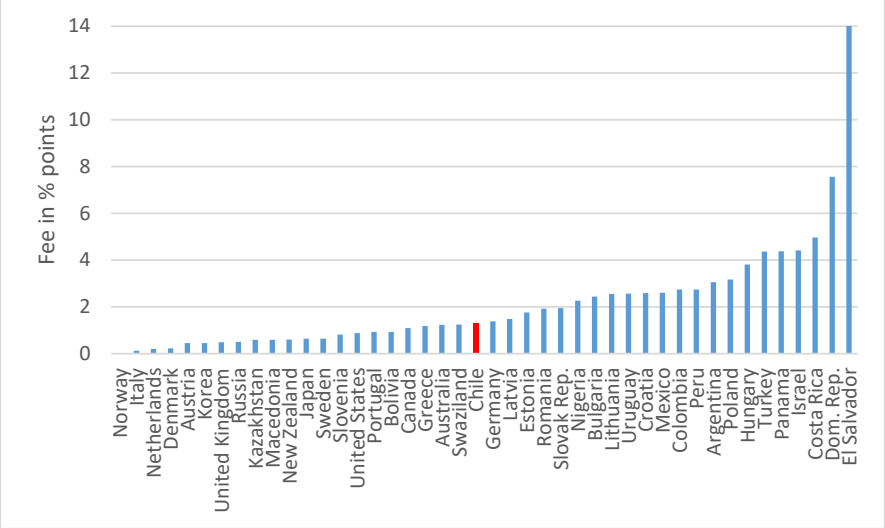


Source: OECD Global Pension Statistics

First, we compute the total fee as the sum of the two. Second, we complement the information for Chile using Table II.3c. If we choose the assumption of a salary real growth rate of 2% and a real rate of return of 3%, the total fees paid by Chilean workers represent 95 basis points. Putting the two together we arrive at Figure II.7. Chile's equivalent asset fee appears to be above the median of 87 bps and just below the mean of 98bps.

Tuesta (2014) undertakes the largest effort in comparing pension fund costs using the Impavido et al. (2010) method. We report below a picture of his results (Figure II.8), which reflects the values as of 2010. In Chile, this ratio is 1.3%, which puts the country at the median of this international sample (1.35) and well below mean (2.17).

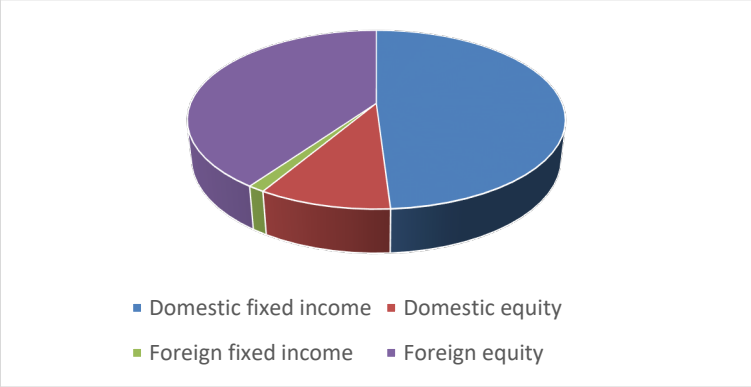
Figure II.8: Pension Fund Income divided by AUM
(in % points)



Source: Tuesta (2014)

These international comparisons do not factor in differences in portfolio compositions. As Figure II.9 shows, 50% of the Chilean AFPs is made of fixed income, which is much cheaper to manage than equity. Thus, Chilean AFPs appear to be cheaper than, for example, the MySuper Australian funds, but the main reason is that MySuper fund tend to invest 80% in equity, a third of which is unlisted equity.

Figure II.9: Composition of the AFP Portfolio
(December 2018)



Source: Data from Superintendencia de Pensiones

3. Concentration Measures

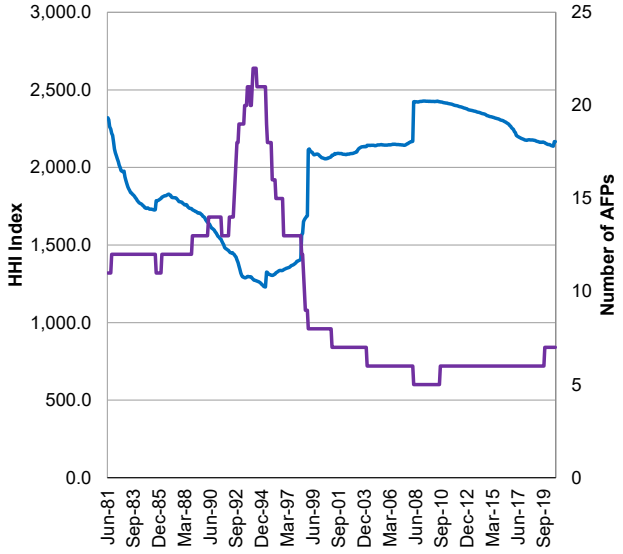
Figure II.10 presents the temporal pattern of the number of AFPs (purple line and right axis) and the Herfindahl–Hirschman Index (HHI) (blue line and left axis). The HHI is computed using the market share of the retirement funds held by each AFP. The U.S. Department of Justice considers as "moderately concentrated" markets with an HHI index between 1500 and 2500.[6] Thus, the AFP market in Chile is "moderately concentrated" throughout its entire history.

An analysis of the variation throughout history in the degree of concentration is very insightful. The concentration in the private pension market is often attributed to the inertia of contributors. Indeed, default options have enormous staying power (Mandrian and Shea, 2001). Yet, Berstein and Cabrita (2007) show, the elasticity of demand for AFP with respect to fees and performance increases notably when a sales agent visit a contributor. Thus, inertia can be overcome, but at the cost of triggering a marketing war among agents, which will increase, rather than decrease, commissions and at the same time reduce profitability of the AFPs. This competitive war was ended by two rules (N. 998 and N.999) issued by the Superintendencia De Administradoras De Fondos De Pensiones in 1998. These rules increased the bureaucratic

[6] https://www.justice.gov/atr/horizontal-merger-guidelines-08192010#5c

burden associated to transferring from one AFP to another (increasing customers' inertia) and required rigid exams to qualify for sales agents, restricting the number of sales agents.

Figure II.10: Herfindahl–Hirschman Index in the AFP market



Source: Author's calculation from data from Superintendencia de Pensiones

Following these rules, competition among sales agents subsided and the market started to consolidate through mergers. From 1998 to 2008 the number of AFPs dropped from 21 to 5, and the HHI index peaked at 2,433.

The 2008 reform separated the provision of disability and life insurance from the asset management activity and introduced a tender every two years for the portfolio of new affiliates. This new bidding process favored the entry of new firms (first Modelo in 2010 and then Uno in 2019), leading to a corresponding decline in the HHI.

4. Competition measures

The HHI index measures the concentration of the existing market but does not factor in the threat of potential entry. In the presence of a significant threat of entry, highly concentrated markets can deliver competitive pricing. A more reliable measure of market power is represented by the Lerner index, defined as the difference between price and marginal cost divided by price. In the AFP market the price is observable, it is the fee charged to workers who contribute to the fund. The marginal cost is not directly observable and thus we will approximate it with the average

cost per peso contributed. To determine this cost, we add personnel expenses, depreciation, and other operating expenses.

Table II.4: Lerner Index of the Various AFPs in 2019

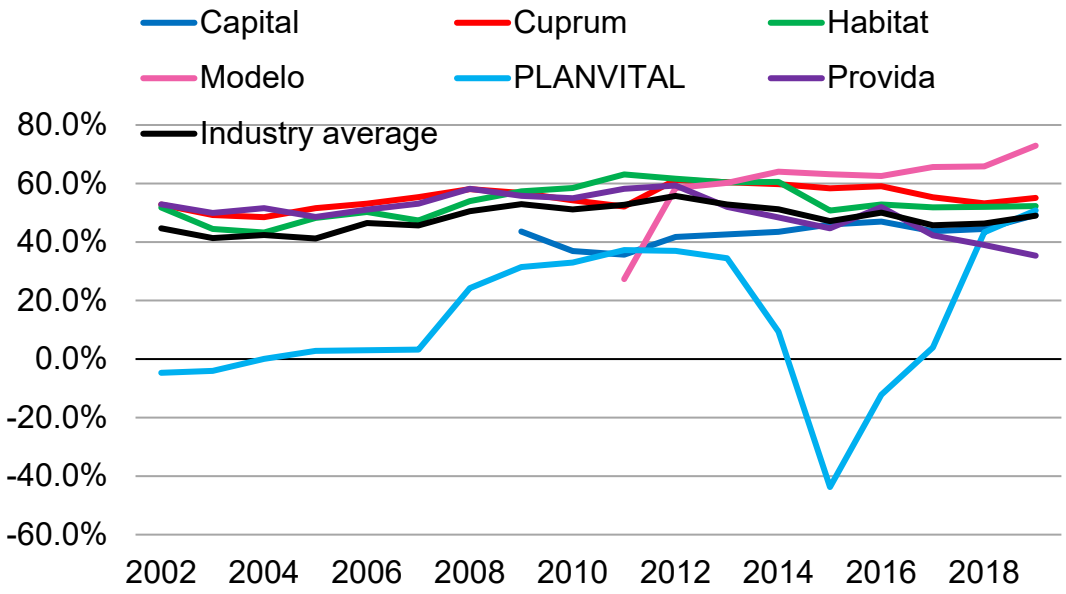
AFP	Capital	Cuprum	Habitat	Modelo	PLANVITAL	Provida	UNO	Total
Revenue	146,683,134	124,256,860	222,264,267	72,934,139	66,534,334	202,614,534	49,857	835,337,125
Personnel expenses	(42,487,988)	(31,597,094)	(51,755,391)	(9,303,042)	(20,387,203)	(70,165,071)	(1,220,990)	(226,916,779)
Other operating expenses	(33,906,318)	(25,947,497)	(42,632,363)	(13,158,237)	(16,114,121)	(43,807,103)	(1,081,443)	(176,647,082)
Total operational costs	(76,394,306)	(57,544,591)	(94,387,754)	(22,461,279)	(36,501,324)	(113,972,174)	(2,302,433)	(403,563,861)
Number of contributors	988,780	495,116	1,314,770	1,264,383	914,718	1,480,397	4,616	6,462,780
Mean salary	10,577,041	17,957,896	11,844,217	8,522,015	6,993,275	8,209,955	868,218	9,899,554
Cost per contribution	7.3%	6.5%	6.1%	2.1%	5.7%	9.4%	574.5%	6.3%
Price per peso of contribution	14.4%	14.4%	12.7%	7.7%	11.6%	14.5%	6.9%	12.4%
Lerner Index	49.3%	55.1%	52.3%	72.9%	50.8%	35.3%	-8226.3%	49.0%

Source: Author's calculation from data from Superintendencia de Pensiones

Since the price is expressed as a percentage of pesos contributed, we want to express also the cost as a percentage of pesos contributed. Thus, we divide the operating costs by 10% of the total annual salary of contributors. The Lerner Index is then derived dividing the difference between the price and the cost divided by the price.

Table II.4 reports these calculations. With the exception of Uno, which was the new entrant in 2019, the Lerner index oscillates between 35% and 73%, with an aggregate average of 49%. The year 2019 is not a special year. Figure 2.11 plots the asset-weighted average Lerner Index in the Chilean AFP market from 2002 to 2019. With the exception of Planvital, there is a remarkable similarity among the Lerner indexes of the different AFPs and remarkable stability over an almost 20-year horizon, in spite of the 2008 reform and the entry of two new players. At the industry level, the lowest point reached by the Lerner index is 41.2%. At the AFP level, the lowest Lerner Index if we exclude Planvital is 27.3% reported by Modelo in the first full year of operations.

Figure 2.11: Lerner Index in the AFP market



Source: Author's calculation from data from Superintendencia de Pensiones

The Lerner Index underestimates the profitability of the traditional AFPs (Capital, Cuprum, Habitat, Provida, and Planvital, henceforth the "traditional five"), which own shares in Previred, the company collecting workers' contributions, and thus benefit of its profits. To correct this underestimate, we add these profits back. As a result, the aggregate Lerner Index in 2019 raises by 2.5 percentage points, bringing it to 51.5%.

5. *Profitability*

In 2017 the UK Financial Conduct Authority (FCA) published a final report of its in-depth study of the asset management market. During the period 2010-2015, the study finds an average operating margin across asset management firms of 34-39%.[7] As a result, the study concludes "price competition is not working as effectively as it could be."[8] In Chile, when we add the

[7] https://www.fca.org.uk/publication/market-studies/ms15-2-2-annex-8.pdf .
[8] https://www.fca.org.uk/publication/market-studies/ms15-2-3.pdf

dividends coming from Previred the average operating margin between 2010-2019 oscillates between 48% and 68%. What should we conclude?

5.1 Cost structure

Before jumping to any conclusion, it is necessary to understand the cost structure of the Chilean AFP industry and factor in the amount of capital invested. Table II.5 decomposes the 2019 cost per pesos of contributions contained in Table II.4 along its main components. We present only the 2019 analysis, since the results are very similar in previous year. We omit Uno because in 2019 it has just entered the market and operated for less than 6 months, so its numbers are not easily comparable.

Table II.5: Cost Structure of the Various AFPs in 2019

AFP	Capital	Cuprum	Habitat	Modelo	Planvital	Provida	Total
Sales costs	2.3%	2.0%	1.1%	0.1%	0.9%	2.0%	1.4%
Other personnel costs	1.7%	1.5%	2.2%	0.8%	2.3%	3.8%	2.1%
Comercialization costs	0.3%	0.2%	0.4%	0.3%	0.4%	0.2%	0.3%
Computarization costs	0.7%	0.4%	0.2%	0.2%	0.8%	0.6%	0.5%
Administrartive costs	1.6%	2.2%	2.0%	0.3%	0.2%	2.3%	1.6%
Other costs	0.7%	0.1%	0.1%	0.4%	1.1%	0.5%	0.4%
Total Cost	7.3%	6.5%	6.1%	2.1%	5.7%	9.4%	6.3%

Source: Author's calculation from data from Superintendencia de Pensiones

Table II.5 shows a remarkable difference between Modelo and all its competitors. Per pesos of contributions, Modelo has roughly one-third of the cost of its competitors. This reduced cost structure is due to lower sales, personnel, and administrative costs. The average sales cost is 1.4% of contributions, and Modelo spends 0.1%. The average "other personnel costs" is 2.1%, Modelo spends 0.8%. The average "Administrative costs" is 1.6%, and Modelo spends 0.3%. These three items alone explain 89% of the lower cost of Modelo. The only item where Modelo seems to spend as much as the other AFPs is the item "other costs".

One important component of "other costs" representing almost half of the "other costs" of Modelo is the cost of collecting the workers' contributions. In Table II.6 we decompose these costs between the costs paid to Previred (the vast majority) and the rest.

Table II.6: Collection Costs of the Various AFPs in 2019

AFP	Capital	Cuprum	Habitat	Modelo	PLANVITAL	Provida	Inudstry Average
Collection costs	**0.12%**	**0.07%**	**0.21%**	**0.18%**	**0.18%**	**0.16%**	**0.16%**
of which Previred	0.11%	0.07%	0.15%	0.17%	0.17%	0.16%	0.14%
others	0.01%	0.00%	0.06%	0.01%	0.01%	0.00%	0.02%
% ownership of Previred	22.6%	12.4%	23.1%	0.0%	3.9%	37.9%	
Dividends from Previred	0.29%	0.17%	0.20%	0.00%	0.08%	0.42%	0.21%

Source: Author's calculation from data from Superintendencia de Pensiones

On average the collection costs amount to 16 basis points. The exception here is Cuprum that pays only 7 bps. Modelo is slightly above the average. Yet, this calculation does not consider the significant rebate that the traditional five AFPs receive from Previred, thanks to their ownership stake. The size of the different stakes are reported in the previous to the last row, while the last row presents the dividend each AFP received from Previred, normalized by the total amount of contributions. Three of the traditional five AFPs (Capital, Cuprum, and Provida) receive more in dividends from Previred than they pay in commissions to Previred. Habitat breaks even and only Planvital receives less than it pays, because its stake in Previred is small. Modelo (and Uno) do not have any stake in Previred.

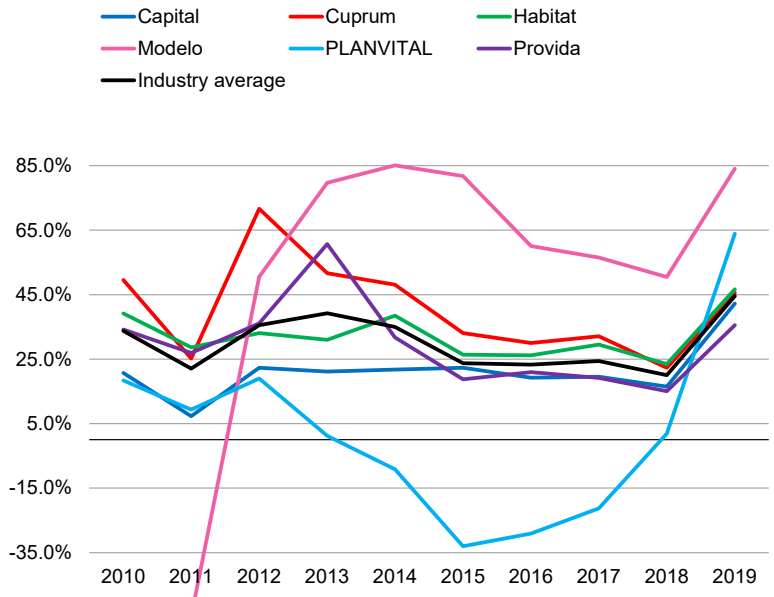
5.2 Capital invested

Very large profit margins can be easily rationalized in capital intensive businesses. For this reason, the UK FCA computes the return on capital employed, comparing firms' cost of capital as a benchmark. In doing so, however, it is necessary to be very careful on how we define capital employed, to avoid the risk of a circular argument. Very profitable business, when they are acquired, are acquired at a large premium over the book value. This difference shows up in the balance sheet in the form of intangibles. If we include the value of intangibles as part of capital employed, we are going to find that even monopolistic businesses do not appear very profitable, since the value of capitalized rents is factored in the denominator of the return on capital equation.

To make this important point clear, let consider New York taxis before the entry of Uber. The number of cabs was fixed by regulation and the cab companies were charging above the competitive price level. The extra profit was reflected in the value of the taxi medallions. Once the cost of these medallions was factored in, the return on capital invested was not out of the ordinary, since the price of the medallion was equalizing the return on capital across alternative uses.

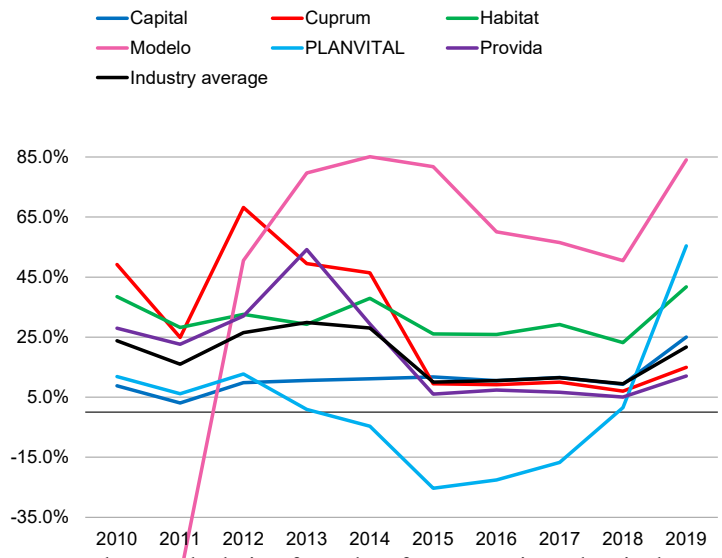
For this reason, we are going to compute two measures. The first measure is the return on equity assuming that the investors did not pay any premium for acquisitions. This measure is obtained subtracting the book value of intangibles from the value of the book equity. The second measure is the return on equity without any adjustment. Since leverage is very low, there is no much difference here between return on capital and return on equity.

Figure II.12: Return on Equity (excluding intangibles)



Source: Author's calculation from data from Superintendencia de Pensiones

Figure II.13: Return on Equity (including intangibles)



Source: Author's calculation from data from Superintendencia de Pensiones

In Chile AFPs must maintain a guarantee fund (*encaje*) equal to 1% of the assets invested by their clients. This fund, which represents a major capital outlay for each AFP, is invested in stocks and bonds and generates a return. Since we going to include the funds for the *encaje* in the capital invested we will add the return on the *encaje* to the EBITDA at the numerator. So we will have

$$ROE_1 = \frac{\text{EBITDA} - \text{Interest} + \text{Return on Encaje}}{\text{E} - \text{Intangibles}}$$

$$ROE_2 = \frac{\text{EBITDA} - \text{Interest} + \text{Return on Encaje}}{\text{E}}$$

Figures II.12 and II.13 plot the behavior of these two measures over time. Since the return on the *encaje* fluctuates with the market return, so do both ROE_1 and ROE_2. Consistent with its low cost structure, Modelo has the highest ROE two years after entry: on average 69%. Since Modelo grew organically, its value of ROE_1 and ROE_2 are the same.

At the other extreme there is Planvital, which saw its ROE go negative in the years it gained market share by bidding low in the auction. For the rest, the AFPs seem to have a pre-tax level of ROE_1 in the mid 20s, while a pre-tax level of ROE_2 around 10% in the second part of the sample. This is not surprising since in the early 2010s several AFP changed owners. Given the premium paid, the new owners do not seem to achieve extraordinary returns on equity. Had

they not paid those premia, their return on equity would have exceeded any reasonable measure of cost of capital.

6. *Evidence of Market Power if Any*

Are Chilean AFPs very efficient or do they enjoy some market power? To answer this question we need to remember what we stated earlier, i.e., that the provision of pensions is composed of four separate activities: i) the collection of contributions, ii) the investment of the portfolio generated by those contributions, iii) the voting on corporate governance matters in the portfolio companies, and iv) the disbursement of the pensions. Activities i) and iv) have large synergies between themselves and are characterized by large economies of scale. Activity ii) does not have any major synergy with activities i) and iv) and does not enjoy major economies of scale, in fact it might have diseconomies of scale after a certain level, unless the strategy followed is indexing. With indexing the only game in town is cost minimization and larger funds can play that game better. Finally, activity iii) has major synergies with ii) and has major economies of scale, because it has very large fixed costs.

In most markets, activities i) and ii) are undertaken together not for efficiency reasons, but for market pre-emption reasons. This combination limits the exploitation of the economies of scale, imposing a higher cost on the system. Not in Chile. The centralization of the collection of contributions through Previred has eliminated duplications in the network and reduced significantly the cost AFPs have to pay to collect the contributions. If everybody had access to the same infrastructure network, competition would take place on marketing expenses or on price (i.e., cost of managing the assets). Note that given the lack of persistence of mutual fund performance, marketing expenses would be completely wasteful from a societal point of view. Thus, ideally, we would like competition to take place only on price. Pension contributors, however, tend to suffer from great inertia: Illanes (2016) show that to rationalize Chilean workers' behavior we need to assume switching costs of the order of $1,200. Illanes (2016) also shows that pension contributors are relatively insensitive to fees. Thus, in general competition does not take place on price.

In Chile, however, the introduction of an auction forces AFP to compete on price for the new comers. The winner of the auction gets all the new entrants for the following two years, roughly 700,000 new clients. Since clients tend to be relatively sticky, these new clients are

likely to stay even after the former winner loses out and is not the cheapest AFP anymore. Thus, we can gain further insight on the structure of the market by studying the bids in the seven auctions for new entrants that took place from 2010 to today (Table II.6).

Table II.6: Bidding Record

Auction Period	Participants	Fee charged on existing clients	Bid (% salary)	Bid (% contrib.)
August2010-July2012	Modelo		1.1%	10.2%
	Planvital	2.4%	1.2%	10.6%
	Habitat	1.4%	1.2%	10.8%
	Cuprum	1.5%	1.3%	11.7%
	Modelo	1.1%	0.8%	7.1%
August 2012	Planvital	2.4%	0.9%	7.8%
July 2014	Regional			
August 2014-July2016	Planvital	2.4%	0.5%	4.5%
	Modelo	0.8%	0.7%	6.7%
August 2016-	Planvital	0.5%	0.4%	3.9%
July 2018				
August 2018-	Nobody			
July 2020				
October 2019-	Uno		0.7%	6.5%
September 2021				
October 2021-	Modelo	0.8%	0.6%	5.5%
September 2023	Uno	0.7%	0.6%	5.8%

Note that incumbent players are forced to offer their existing clients the same price they bid in the auction for new contributors. Thus, incumbents are more reluctant to offer low prices, even if their existing cost is low, because they will lose a large fraction of the existing rents.

In the first auction, in 2010, Planvital was willing to slash its prices by almost 50% to win the auction. The entry of Modelo, however, made that price reduction insufficient. In the second auction, Modelo reduced its own price by 32% making vane an offer by Planvital, which was willing to cut its price by 64%. It was only in the third auction that Planvital was able to win, slashing its prices by 80%, to 4.5%.

Given Planvital cost structure, the 4.5% bid was not sustainable in the long term, as shown by its negative return on equity. In fact, in 2018 Planvital almost tripled its commission to 11.6%,

regaining profitability. Modelo with its price of 7.7% gained the contributions of the new entrants until Uno entered the market in October 2019 with a bid of 6.5%. Given its cost structure, Modelo could have fended off the entry of Uno, but chose not to, at least in 2019. It is hard to tell whether it was surprised by Uno or did not want to erode its margin further.

With the cost structure derived in Table II.5 we are able to understand the strategy played in the 2021 bid. If we assume that clients are sticky, by bidding a price *p* a winning bidder will gain

*Gain: (p-c)*680,000 *Mean salary*

after two years, where *c* is its cost per contribution, 680,000 is the number of new entrants and the mean salary is the average salary of the new entrants. At the same time, an existing player that is currently charging P will lose

*Loss = (P-p) * Number of contributors * Mean salary contributors.*

From these two equations it is pretty clear that new entrants will bid their cost, while existing players will shade the bids to reduce the loss on existing customers.

Table II.7 calculates the gains and losses of the various players were they to bid 0.69% of salary (the winning bid of Uno in 2019) or 0.58% of salary (the winning bid of Modelo in 2021). Note that we do not report any value for Uno, because the estimates of the cost structure are not reliable, since it is a new entrant.

Table II.7: Bidding Strategy

	Fee as % of income	Fee as % of contrib	Cost as % of contrib	Bid at 0.69%		Bid at 0.58%		Bid at 0.574%	
				Cost bn CLP	Benefit bn CLP	Cost bn CLP	Benefit bn CLP	Benefit bn CLP	Cost bn CLP
Capital	1.4%	12.6%	7.3%	(453)	(32)	(525)	(68)	(529)	(70)
Cuprum	1.4%	12.6%	6.5%	(365)	(1)	(423)	(37)	(427)	(39)
Habitat	1.3%	11.3%	6.1%	(480)	15	(577)	(22)	(582)	(24)
Modelo	0.8%	7.1%	2.1%	(50)	163	(120)	126	(124)	124
Plantivtal	1.2%	10.4%	5.7%	(161)	28	(201)	(8)	(203)	(10)
Provida	1.5%	12.7%	9.4%	(521)	(109)	(602)	(145)	(607)	(147)
Uno	0.7%	6.5%							

At 0.69%, only three of the seven funds (plus possibly Uno) make money on the additional customers. Thus, they have no interest in bidding. Of these three players, only one would gain more for the profits it will make on new customers than what it loses on the existing

customers. So, Table II.7 makes it clear that only Modelo will have an interest in entering the bid in 2021. The other potential player is Uno.

We can also predict how low Modelo will bid. At 0.574% of salary, its gain 124bn will almost exactly match its losses (124). So Modelo will never bid below that level. In fact, Modelo bid 0.58.

In sum, the 2008 reform has segmented the AFP market into two. There is the market of new workers, whose affiliation is auctioned off to the lowest bidder, and there is the legacy market. In spite of the auction, the market for new workers is not fully competitive for lack of a sufficient number of bidders. At the current structure of fees, only Modelo and Uno can compete. It will be interesting to see whether Uno will be able to survive after losing the auction to Modelo. While theoretically, two bidders are sufficient to lead to compression of the prices, in practice it is unlikely to be the case. It is worrisome that at the end of 2020 Uno's profitability net of the return on the Encaje was negative. Thus, it is not profitable to enter into the market if the new entrant wins only one auction. Thus, we should not expect new entry in the future.

On the other hand, the legacy market does not face any form of competitive pressure. The traditional AFPs retain a cost that is at least three times that of Modelo. They do not compete in the new workers market, but also they do not try to compete in the legacy market, maintaining very similar prices (between 11.6% and 14.4%) with margins varying between 47% and 53%. In this segment, workers pay more for two reasons: because the cost structure of the AFPs is too heavy and because lack of competition fails to reduce the profit margins.

Since retirement contributions are mandatory, commissions do not affect the size of the retirement market, but only the distribution between suppliers and customers. Yet, besides equity considerations, there are two efficiency reasons why reducing commission will be welfare enhancing. First, the presence of rents generates inefficient rent-seeking behavior (see Tullock (1967) and Zingales (2015) for an application to finance). Second, there is a large elusion and evasion of retirement contributions in the informal sector in Chile. If this elusion is sensitive to the cost imposed on the retirement system (as is likely to be the case), lowering costs will increase welfare.

6. *Possible solutions*

The Chilean market has a very unique peculiarity: workers pay up front for the cost of managing their assets. As a result, all the competition is aimed at capturing new contributions, not at capturing assets to manage. The most direct effect of this peculiarity is that later in life – when workers have more assets in their pension funds and become more sensitive to the cost of managing them – they have reduced incentives to move their assets and AFPs have no incentives to attract them. Combined with the natural inertia of pension contributions (Mandrian and Shea, 2001), this peculiarity prevents competition to put pressure on costs.

The 2008 reform, which introduced a biannual auction to allocate the new contributors, has succeeded in reducing significantly the fees. Yet, the segmentation of the market has prevented the benefits of this reform from spreading to pre-existing contributors. Eventually, the legacy AFPs will be forced to adapt and compete in the primary market by the shrinking pool of legacy customers, yet it will take many years. In the meantime, legacy customers are substantially overcharged for the management of their pension contributions, reducing the pension they will have available at retirement.

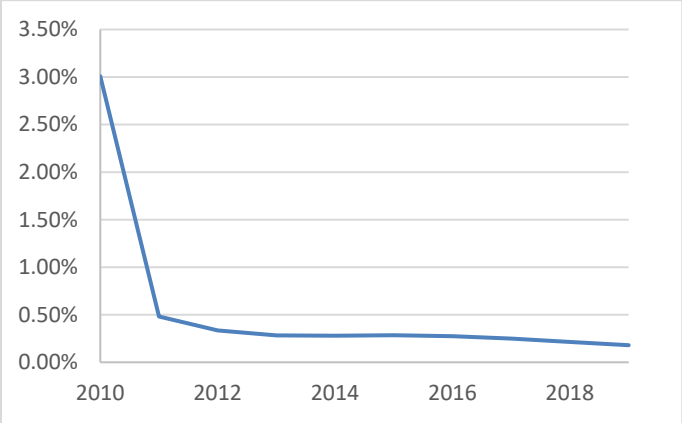
The most obvious reform, moving to a system of contributions based on assets under management, will be extremely unfair to legacy contributors. Unless they are credited the remaining value of the fees they have already paid, they will end up paying twice for the same service. While it is possible to estimate what is the "unused portion" of their ex-ante fee (the calculations conducted in section 2.3 provide guidance), the exact amount of this rebate is dependent on several assumptions. Given the lobbying effort the AFPs will certainly exert on this issue and the lack of a natural balance to this lobbying effort, we fear that any reform in this direction will make things worse, rather than better, for all the legacy contributors.

Excluding this possibility, there are two margins public policy can use to make the market for legacy contributors more competitive. The first is the creation of an alternative "Previred", the second is to spread some of the benefits of the auction also to legacy workers. We will analyze them in turn, even if they interact and the benefits are maximized when both actions are taken simultaneously.

6.1 A Worker-Owned Previred

While the consolidation of the collection is very efficient, it might create a barrier to entry, as we discussed in section 5.1.

Figure II.14: % Fees Paid to Previred by Modelo



As Figure II.14 shows, a new entrant like Modelo in 2010 is required to pay a higher percentage of its contributions in fees to Previred. This pattern suggests that Previred uses nonlinear contracts, proportionally more expensive for smaller amount of contributions. We do not know enough about the cost structure of Previred to know whether these contracts are justified on the basis of differential costs, but there is no doubt that these contracts can act as a very effective barrier to entry. If Uno is still not profitable at the end of 2020, it might be in part for these nonlinear contracts. Anticipating this obstacle, future new entrants are less likely to be willing to take the risk to enter the market and bid for the auction. Thus, the fear is that future auctions will go deserted.

Previred can act as a barrier to entry in another way. If Previred overcharges for its services, the five traditional AFPs are happy since they receive back in the form of larger dividends more than they pay in larger fees, while the two recent new entrants (Modelo and Uno) are disadvantaged. Not only do they pay higher fees, they also end up subsidizing their competitors. This structure reduces competition and forces an increase in the cost of the entire system. Higher Previred fees put a lower bound to the fee Model and Uno can bid in the auction, increasing the cost for the entire system.

If we want to increase the degree of competition in this industry, thus, we need to intervene on the collection and distribution function. While it is efficient that these functions are played by a single entity, it is not efficient that this single entity is controlled and managed by (a subset of) incumbents players. The Swedish solution is to have a state owned and controlled entity to play this role. We think this is not necessary or even desirable. It would be sufficient to create a not-for-profit cooperative owned by the contributing workers, with a very clear mandate to maximize the welfare of all contributors spelled out in the charter. We know from Hansmann (1997) that cooperatives work well only when the capital needs are limited and there is a strong homogeneity in the patrons' interest. This is indeed the case for a collection and distribution entity. Besides an initial set up costs, capital needs are limited. Most importantly all contributors want the same things: good services at a low price and the promotion of new entry in the asset management space, entry that would reduce further the cost to accumulate money for retirement.

Thus, a worker-owned version of Previred not only would not charge higher fees to a new entrant, it would offer a subsidy to a new entrant if the new entrant promise to undercut the incumbents in the auction, reducing the price of services for new workers and potentially (see the discussion later) for all workers. The benefit of a worker-owned Previred versus a state-owned Previred is that it would be free from political control: the board members will have a fiduciary duty towards the workers and can be sued if they do not act in the workers' interest.

How to transition from the current situation to the desirable one? The only real valuable asset of Previred is the fact all the AFPs use it. Thus, it would suffice for the Government to mandate all AFPs to use a newly created cooperative. This would instantaneously transfer most of the value to the new entity, without any need of buying out Previred from the existing owners.

6.2 Spreading the Benefits of the Auction

While the auction has been highly beneficial to reduce fees, its design has an unfortunate feature: it benefits only the new contributors and the legacy contributors of the winning bidder, but not the other legacy contributors. Not only does this design penalize the legacy contributors, it also discourages incumbent players from bidding lower fees. As Table II.7 shows, high-cost incumbents lose a lot from bidding and thus they do not bid, reducing competition and maintaining their rent. To prevent this from happening, we need to find a way to extend some of the benefits of the lower prices offered in the auction also to the legacy workers, with two

benefits. First, at least some of the legacy workers will pay less. Second, knowing they might lose some of their rent even if they do not bid, the incumbent players will be more likely to bid, increasing competition in the auction.

The mechanism through which this result is achieved is less important than the principle itself and it depends a lot on what is legally feasible. One avenue is to cap the fees of the legacy workers of the non-bidding AFPs at a multiple of the fees prevailing in the auction. For example, the fees can be capped at 50% more than the winning bid in the last auction. Note that, given the high-cost structure of the traditional AFPs, this incentive alone will not be sufficient to induce them to bid lower than 0.58% in 2021, as Table II.7 shows. Yet, the existence of a mechanism like this would create pressure to reduce the cost. This solution has two unappealing features. First, the level of the multiple is very arbitrary. Too high and it will have no effect, too low and it will force all the AFPs into a low service equilibrium. Second, it is fairly coercive. Some workers might need higher-cost service providers and this solution would make it impossible.

The alternative is to mandate legally that a fraction of the legacy workers be reallocated to the new low-cost bidder, allowing them the option to switch back at any time. The advantage of this solution is twofold. First, it does not force people into buying a product that they do not like, since they can switch back right away. Second, it increases the rewards of winning the auction, increasing the number of participants. The negative aspect of this solution is that it imposes a bureaucratic cost to workers who have to make an effort to switch back. A traditional economist would argue that by revealed preferences workers have shown that they do not want to switch, why do we force them? This objection, however, does not consider three important aspects. First, starting with Mandrian and Shea (2001), an extensive literature has shown that investors are myopic and do not optimize the switching decision. Second, most investors are poorly informed about the lower costs option. Three, we are not talking about the free choice of an investor, but the constrained choice of a worker who is forced by law to be an investor. Thus, reallocating those workers to lower costs options, leaving them the choice to change at any time, is not that coercive after all.

The beauty of this solution is that it can be tried on a small scale and then studied. One or two thousand workers of the legacy AFPs can be transferred to Modelo, the low-cost bidder of the last auction, explaining to them why this transfer was made and leaving them the option to switch back. We can then observe after two years how they feel about this transfer and how

many have transferred back. We can even estimate empirically what is the cost in term of time they spent to transfer back. On this basis, we can then decide whether this forced transfer is worthwhile.

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Chapter III. Analysis of the Asset Management Market

1. Definition of the market

The asset management industry in Chile is a US$72 billion industry, with thousands of differentiated products (IMF, 2021). Our analysis will focus only on the regulated open-end fund segment.

2. Prices

Given the wide product differentiation, a meaningful comparison of the price can only be conducted within similar (ideally identical) products. For this purpose, we will focus on a category: index funds, in particular funds indexed to the Chilean stock market and to the Chilean bond market. Fund prices may reflect the different abilities of fund managers in picking stocks or the different costs of trading the securities that comprise the portfolio. The great advantage of index funds is that these two sources of variations are removed.

Even for homogenous products, like index funds, a huge element of differentiation is represented by the distribution channel. Different channels provide a different level of convenience for investors and they come at very different costs. Thus, to compare apples with apples, we further restrict the attention to open-end funds that are offered as part of a voluntary pension fund or APV (Ahorro Previsional Voluntario). The fee charged for APV tend to be the lowest, so we consider the fee charged for APV. Some fund families charge different fees for the same product sold through the same channel if the amount invested differs. When this is the case, we choose the lowest fee, offered for larger investments. Thus, the numbers we report represent a lower bound of the fees charged.

By using the CMF database of all Chilean mutual funds, we could identify 9 APV funds indexed to the Chilean stock market and 12 APVs indexed to the Chilean bond market. The name of the funds is reported in Table 3.1. Since Sirri and Tufano (1998) the total annual fees of a fund are computed as a fund's annual fees (both management fees and 12b-1 fees if applicable) plus one-seventh of total loads, assuming a mean holding horizon of seven years. Table 3.1 reports these fees in basis points, as of 2020.

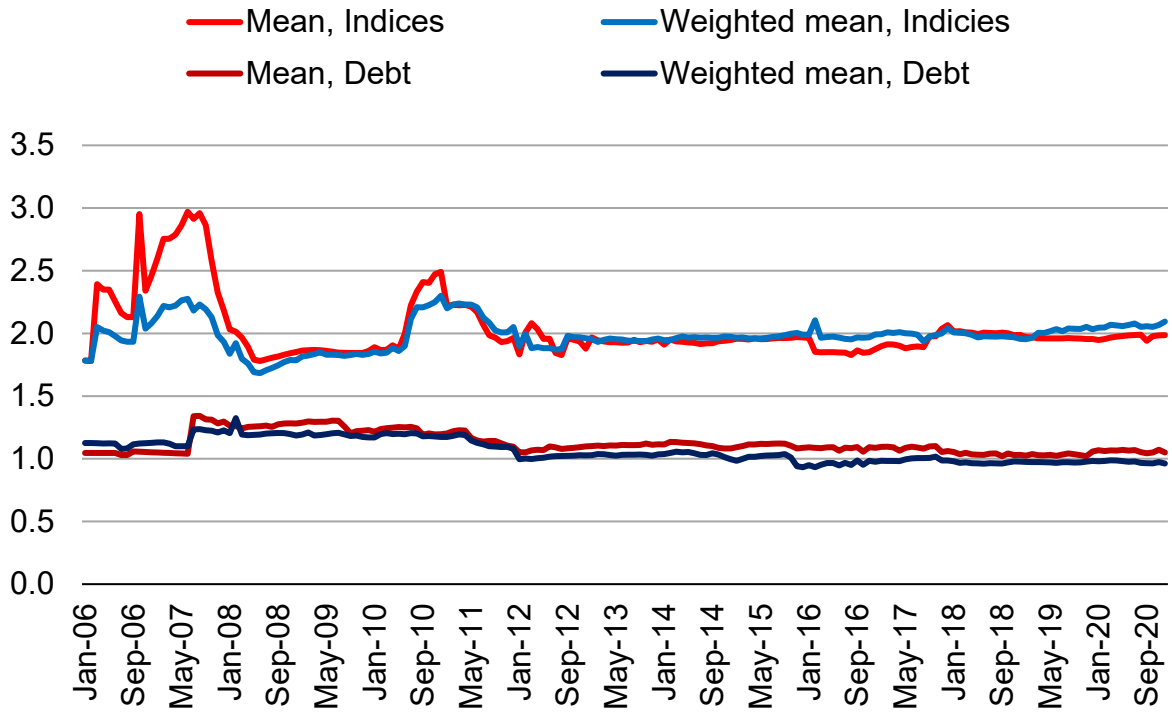
Table III.1: APV Index Fund Fees

	BTG	Larrain.	Principal	SURA	Zurich	Banchile	BEstado	BCI	Bice	Itau	Santander	Scotia	Security	Average
APV Equity Indices Prices		3.4%		1.8%	3.2%	4.6%		1.8%	2.0%	2.3%	2.0%	1.4%		2.5%
APV Debt Indeces Prices	1.2%	1.2%	1.1%	0.8%	1.4%	1.0%	1.5%	0.8%	0.5%		0.9%	1.4%	0.8%	1.1%

Even if the number of companies offering index products is limited, there is a wide range of prices offered. The ratio between the most and the least expensive products is 3, both in the equity index funds and in the bond index funds. This is not a phenomenon unique to Chile. Hortacsu and Syverson (2004) find a ratio of 3 between the 75% and the 25% percentile and of 8 between the 90th and the 10$^{th.}$.

In spite of the wide cross-sectional variability, the temporal variability is quite limited. As Figure 3.1 shows, the mean level of fees has been roughly constant for the last 15 years and remarkably stable over the last 10 years.

Figure III.1 Fees of Index Funds (%)



2.2 Quality

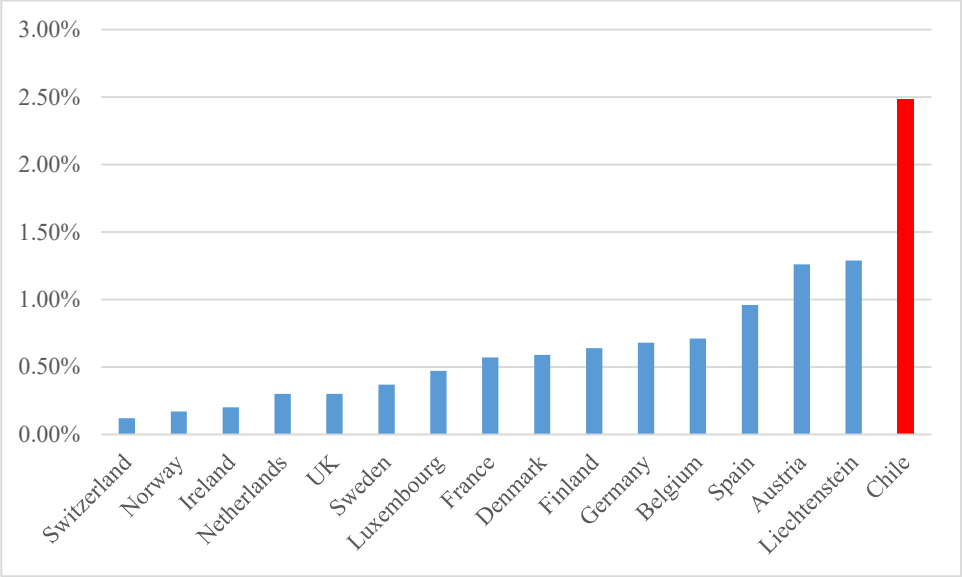
The choice of focusing on a very narrow product category was designed precisely to minimize, if not eliminate, differences in quality. Yet, there might be differences in ease of access and customer care, we are not controlling for. The possibility of these differences should be considered in the rest of the analysis.

3.1 International Comparison

Hortacsu and Syverson (2004) analyze S&P 500-indexed funds in the United States between 1995 and 2000. They find that in 1995 the average fee was 82.4 bps, while in 2000 97.1 bps. DeHaan et al. (2021) compute the average fee of US index funds from 1994 to 2017 and they find an average of 69 bps, with an interquartile range from 20 to 115 bps. Thus, the fees of all Chilean equity index funds are above the 75th percentile of the fees charged by US funds.

As Hortacsu and Syverson (2004) show, competition in the market for index funds is affected by search costs, which prevents the index fund offering the highest utility from capturing the whole market. The level of these search costs is greatly influenced by the financial sophistication of investors. S&P Global Financial Literature Survey estimates that only 41% of the families in Chile are financially literate vs. 57% in the United States.[9] Thus, it is not unreasonable that search costs are higher in Chile and so are the average fees.

Figure III.2: Fees for Indexed Equity Funds



Source: Morningstar European Cost Study

In Figure III.2 we compare the fees of indexed equity funds in Chile and in European countries. The data for European countries comes from a Morningstar study[10] and refers to 2016, while the Chilean data is the one obtained above for 2020. Chile appears substantially more expensive

[9] https://gflec.org/wp-content/uploads/2015/11/3313-Finlit_Report_FINAL-5.11.16.pdf?x28148.
[10] https://www.fondbolagen.se/globalassets/faktaindex/studier-o-undersokningar/morningstar_european_cost_study_17082016.pdf

than all the European countries reported, in fact twice as expensive as the most expensive European country.

3. Concentration Measures

Figure III.2 shows the number of fund families and the HHI index in the last ten years. The level of HHI is low and decreasing and the number of fund families in the market is increasing. Thus, there is no sign of excessive concentration or increasing barriers to entry. Figure III.3 repeats the same exercise for the equity index fund segment. This is presented mostly for completeness because it is hard to argue that this is a separate market since there are many funds that are quasi-indexed and are an almost perfect substitute for an index fund. Yet, even if we restrict the attention to this segment of the market, the concentration is not very high and it is decreasing.

Figure III.2 Number of Players and HH Index in the Overall Mutual Fund Market

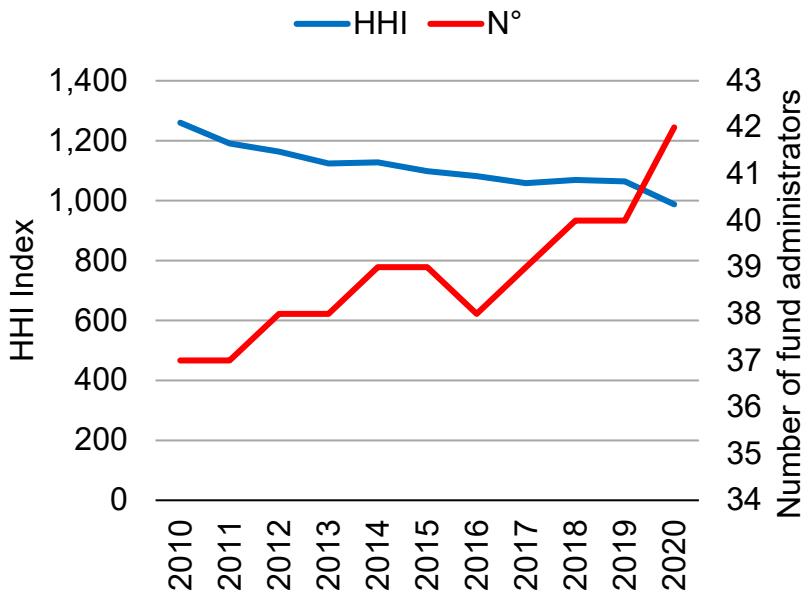


Figure III.5 shows the evolution of the market share of the main players in the equity index fund market in the last 10 years. Santander, the market leader and one of the most expensive funds, loses progressively market share, while one of the cheaper fund (BCI) gains significantly market share in the last few years. Thus, price competition seems to work to keep the market under control.

Figure III.3 Number of Players and HH Index in the Segment of Equity Index Funds

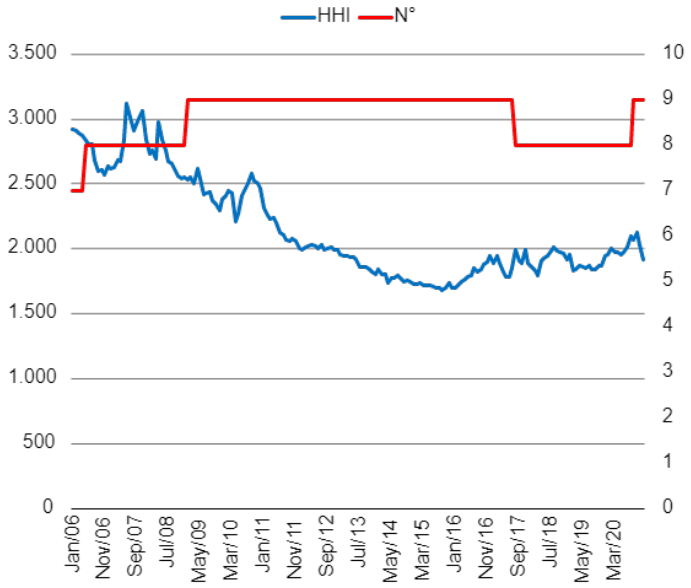
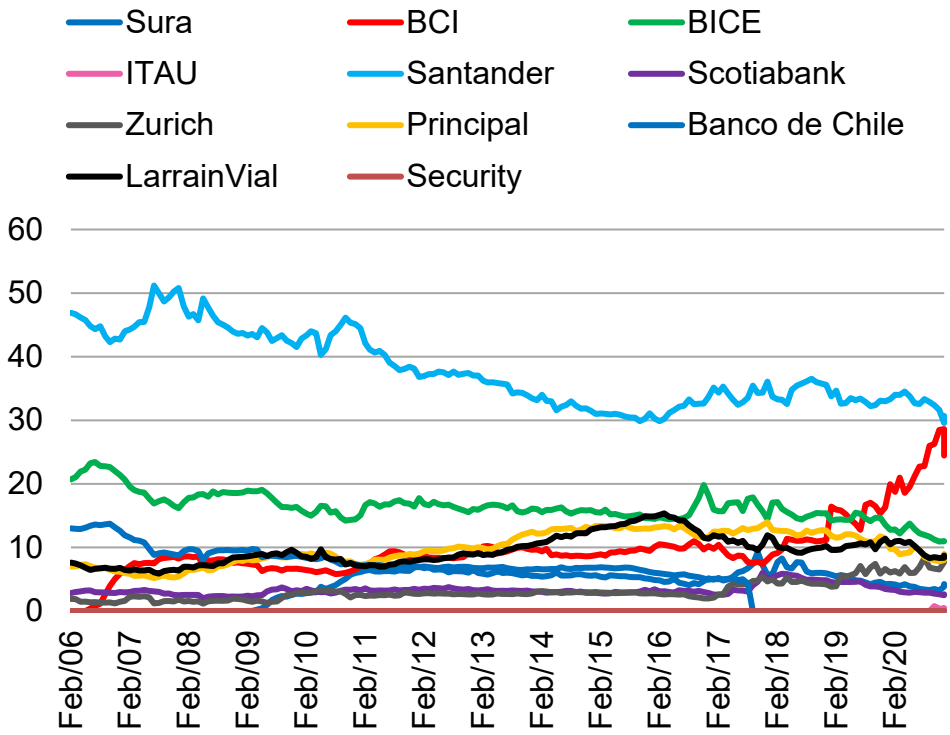


Figure III.4 Market Share of the Main Players in the Market for of Equity Index Funds



4. Competition measures

As we explained in Chapter II, a more reliable measure of market power is represented by the Lerner index, defined as the difference between price and marginal cost divided by price. In the mutual fund market, the price is observable: it is the fee charged. The marginal cost is not directly observable and thus we will approximate it with the average cost, which we infer from the financial accounts as for the AFP. Yet, there are two additional problems here, due to the fact that (unlike for the AFP), mutual fund companies are not forced to report the financial accounts separately by product.

The first problem is that while we observe the price for different products (an equity index fund and a bond index fund), we do not observe the average cost separately. To fix this problem, in the first row of Table III.2, we construct a weighted average price, by assuming that 20% of the revenues come from equity products and 80% from debt products (the average for the entire system). Yet, this measure is not available for most of these families, which sell only one of those two products. For this reason, we redo the calculations by using the effective price, which we compute by dividing total revenues by assets managed. The results for 2020 are reported in the second row of Table III.2.

The second problem is that in many cases the financial accounts exhibit large related party transactions (operations with other companies of the same group). As for the AFP, to determine the average cost we add personnel expenses, depreciation, and other operating expenses. Then, we divide this by the total amount of assets under management to derive the average cost per peso managed. Yet, some of the transactions with related parties may be done at prices different than the market. In fact, they are often used to boost the profitability of one company or a group at the expense of the profitability of another. To ensure the robustness of the results, we compute two measures of cost, one that includes the related party transactions and the other that does not. Table III.2 reports the results for 2020.

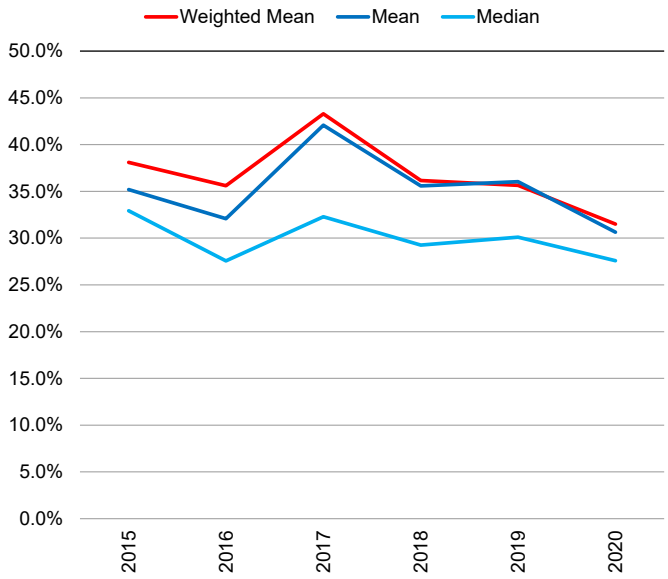
Table III.2: APV Price Structure

	BTG	Larrain.	Principal	SURA	Zurich	B.Estado	Banchile	BCI	Bice	Itau	Santander	Scotia	Security	Overall
Weighted Av. Price		1.7%		1.0%	1.8%		1.7%	1.0%	0.8%	0.5%	1.1%	1.4%		
Effective price	2.3%	0.4%	1.2%	1.6%	1.5%	0.5%	0.7%	0.8%	0.8%	0.5%	0.7%	0.5%	0.8%	0.8%
Cost	1.6%	0.3%	1.3%	1.6%	0.9%	0.2%	0.5%	0.4%	0.6%	0.2%	0.6%	0.2%	0.7%	0.5%
Cost w/o RPT	0.9%	0.1%	0.7%	0.7%	0.9%	0.2%	0.1%	0.3%	0.2%	0.2%	0.1%	0.1%	0.3%	0.2%
Lerner index	28.6%	27.6%	-1.7%	-3.8%	38.0%	54.3%	26.8%	52.2%	23.0%	57.3%	16.2%	69.6%	10.1%	31.5%
Lerner index w/o RPT	58.5%	70.2%	45.4%	55.5%	41.7%	66.8%	79.8%	58.4%	77.5%	68.0%	88.0%	81.0%	60.1%	72.0%

In the last two rows of Table III.2, we compute the Lerner Index (price minus cost divided by price) using the two measures of costs. When we treat the related party transactions as costs, we obtain an average Lerner index of 32%. When we exclude the related party transactions, we obtain an implausible 72%. The latter seems implausible high so for the rest of the analysis we will treat the related party transactions as legitimate expenses. All the concerns we will raise will only be exacerbated if any fraction of the related party transaction is not a legitimate business expense.

As Figure III.5 shows, this level seems to have been fairly constant over the last few years.

Figure III.5 Lerner Index over Time



5. *Profitability*

5.1 Cost structure

To better understand the mutual fund market, in Table III.3 we analyze the cost structure of the main players in the index fund market in 2020. Total costs are composed of sales and distribution charges on the one side and administrative costs on the other.

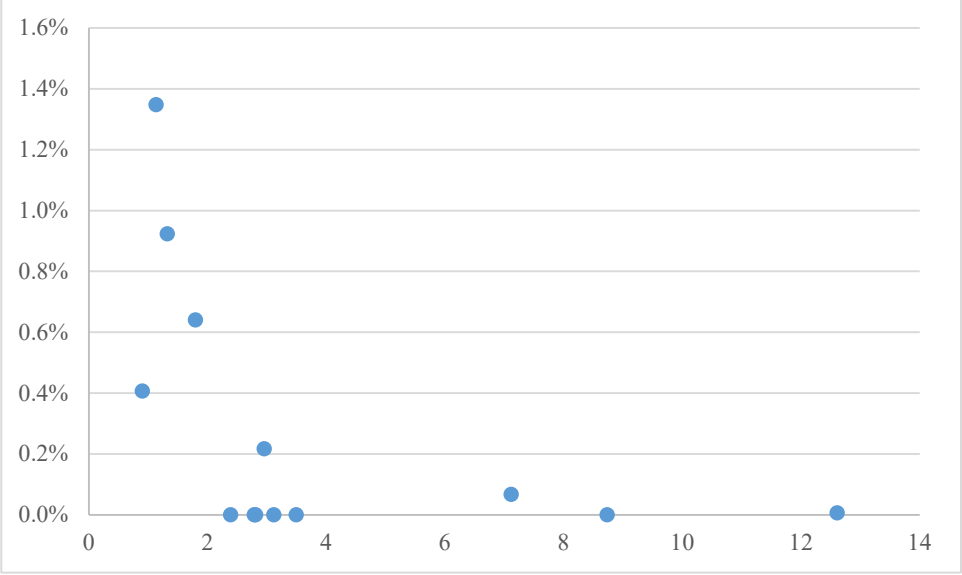
Table III.3: Structure of Costs

	BTG	Larrain.	Principal	SURA	Zurich	B.Estado	Banchile	BCI	Bice	Itau	Santander	Scotia	Security	Overall
Sales and distrib.	1.3%	0.0%	0.6%	0.9%	0.4%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%
Administration	0.3%	0.3%	0.6%	0.7%	0.5%	0.2%	0.5%	0.3%	0.6%	0.2%	0.6%	0.2%	0.5%	0.4%
Total Cost	1.6%	0.3%	1.3%	1.6%	0.9%	0.2%	0.5%	0.4%	0.6%	0.2%	0.6%	0.2%	0.7%	0.5%

There is a wide range of costs: from 20 bps to 160 bps. The big source of variation, however, comes from the distribution costs. The administrative costs are between 20 and 70 basis points, with almost half of the sample having administrative costs equal to or below 30 bps. In contrast, the distribution costs oscillate between 0 and 130 bps.

Note that the first five fund family are not associated with a deposit-taking institution, while the last eight are. Fund families associated with deposit-taking institutions tend to have zero sales and distribution costs, while the others tend to have significant distribution costs. In Figure III.6, we plot the distribution costs as a function of the assets under management in trillions of pesos. All the major funds have no distribution costs, while the small ones do. Thus, fund families associated with a deposit-taking institution tend to be large and have low overall costs, while the others tend to be small and with high costs.

Figure III.6 % Distribution Costs as a Function of AUM



5.2 Return on Invested Capital

In Table III.4 we calculate the return on invested capital (ROIC) for the main mutual fund companies. This is computed as the average over the period 2015-2020.

Table III.4: Return on Capital Invested

BTG	Larrain.	Principal	SURA	Zurich	Banchile	BCI	BEstado	Bice	Itau	Santander	Scotia	Security	Average
52.4%	74.0%	-70.2%	12.3%	70.1%	47.1%	33.8%	140.6%	31.8%	65.9%	69.2%	42.0%	14.5%	44.9%

We can notice a big difference between the first five mutual fund companies and the last eight. The first five have a much more variable ROIC, with an average of 28%. The last eight (which are associated to a deposit-taking institution) have an average ROIC of 56%. While it is hard to justify a 28% cost of capital, it is almost impossible to justify a 56% one.

6 *Evidence of Market Power if Any and Possible Sources*

In 2021, the Boston Consulting Group conducted an analysis of the global asset management industry.[11] It finds that the average level of operating profits over revenues (what corresponds to the Lerner Index computed above) in the asset management industry is 34%, very close to the Chilean level of 33%. The average fees and management costs, however, are much smaller in the BCG global sample: the net revenues as a share of AUM are 24 bps versus the 76 bps in Chile and the management costs net of distribution costs are 16 bps vs the 44bps in the Chilean sample. Thus, the Chilean asset management market seems to be more inefficient but not less profitable than the asset management market in other countries.

We would arrive to the same conclusion by comparing to the UK asset management industry. In 2016 the UK Financial Conduct Authority (FCA) undertook an in-depth study of the UK asset management industry. It found that the level of operating profits over revenues for the period 2010-2015 was between 34 and 39%.

Finally, the competitive nature of the asset management industry is demonstrated by a healthy dynamic of entry. In the last few years, two Fintech mutual funds entered in the index fund segment of the market: Fintual and SoyFocus. Fintual offers an index fund with a fee for

[11] https://web-assets.bcg.com/79/bf/d1d361854084a9624a0cbce3bf07/bcg-global-asset-management-2021-jul-2021.pdf

APV equal to 0.49%[12] and SoyFocus equal to 0.45%[13], significantly undercutting all players in the market and bringing the cost down to the average observed in Europe (Figure III.2).

The evidence discussed above only suggests that the asset management industry does not work any worse in Chile than in the rest of the world. It does not mean that the asset management industry in Chile is highly competitive. After finding that the UK asset management industry has a level of operating profits over revenues between 34% and 39% and a return on invested capital between 20% and 45%, the FCA concludes that "price competition is weak in a number of areas of the industry. Despite a large number of firms operating in the market, based on our sample, we found evidence of sustained, high profits over a number of years."[14] It later adds: "Firms do not typically compete on price, particularly for retail active asset management services." The simple explanation they provide is that "some charges might not always be visible to retail investors and, even when they were, investors might not pay sufficient attention to charges or understand their impact on investment returns. The low visibility of charges and lack of understanding can create harm in two ways: directly by causing investors to hold poor value for money products, and indirectly through reducing competition between asset managers to lower charges over time."[15] This conclusion is confirmed by DeHaan et al. (2021) who find that "funds with higher fees have greater narrative complexity (i.e., less readable disclosures) and structural complexity (i.e., more complicated fee structures), both of which increase investors' processing costs."[16]

7 Recommendations

The asset management industry does not suffer from excessive concentration or disproportionate barriers to entry. Yet, behavioral biases impede price competition to work effectively. Research shows that one of the key problems is the lack of saliency of costs for investors.[17] Past performance (even if not predictive of future performance) and other considerations (like the persuasion power of the seller) play a much bigger role than fees in

[12] https://fintual.cl/numeros-en-detalle
[13] https://www.soyfocus.com/como-invertimos/
[14] https://www.fca.org.uk/publications/market-studies/asset-management-market-study
[15] https://www.fca.org.uk/publication/occasional-papers/occasional-paper-32.pdf
[16] deHaan, Ed and Song, Yang and Xie, Chloe and Xie, Chloe and Zhu, Christina, Obfuscation in Mutual Funds (July 8, 2021). Journal of Accounting & Economics (JAE), Vol. 72, No. 2/3, 2021.
[17] https://www.fca.org.uk/publication/occasional-papers/occasional-paper-32.pdf

determining the investment. As a result, funds compete on other dimensions, leading to an excessive cost borne by savers. The early years of AFPs in Chile illustrate this problem clearly, as do they show the Chilean Government's willingness to intervene to reduce the wasteful aspects of competition. In the same way, the Chilean Government could intervene in the APV market to reduce the excessive cost borne by savers. We do not think that any single measure alone could fix the problem, but a combination of initiatives could go a long way in this direction. Below we list some suggestions:

i. Fight Obfuscation

DeHaan, et al. (2021) find that obfuscation and complexity benefit funds with higher fees. Thus, the first effort should be in reducing obfuscation and complexity. In the AFP market, regulation has already limited the number and type of fees a fund can charge. We would suggest going in the same direction here, limiting the type of fees to two: a load fee and a management fee. In addition, we would require that these fees can modify only two aspects of these fees: the basis and one threshold, so that for investment amounts less than x the per-peso fee could be different than for amounts bigger than x. This seems to be a reasonable compromise between allowing funds to charge differently to investors that have a different cost of services and preventing excessive price differentiation that confuses investors. These prices and thresholds should be disclosed clearly to investors via a prospectus that needs to be elaborated by the CMF after adequate testing.

ii. Positive Nudge

Hayes et al. (2018) show that proper disclosure increases consumer sensitivity to price. We suggest that before subscribing to any fund a consumer should acknowledge to have read a sentence like the following, ideally crafted by the Chilean correspondent of the American Finance Association: "Research shows that on average active investing does not do better than indexing (passive investing) and that the most important determinant of your long term returns is the fee you pay to invest. This fund's fees are ….", where the dots in this sentence should be substituted by "much more expensive", "more expensive", "less expensive", and "much less expensive" than the average fees based on the quartile of the fee distribution of the previous year.

Some people may find this sentence too aggressive, almost like a discouragement to buy higher quality funds. Yet, we will have no problem in putting a sentence like this in the description of a medicine. Furthermore, if the quality is really important to the consumer, she would be happy to ignore the sentence. Imagine that a similar sentence was required to purchase wine. Would you not buy your preferred wine if you find out that is much more expensive than the average wine? If the price reflects a difference in quality, buyers who appreciate quality would not be deterred. By contrast, buyers who do not appreciate quality would probably be deterred, as they should, since they are paying more than they should, given their taste. Thus, this positive nudge would favor competition.

iii. Facilitate switching

Once disclosure is better and fees have been made more salient by the positive nudge discussed above then reducing switching costs would trigger price competition that should reduce fees. To reduce switching costs, we propose to reduce the friction that consumers face in switching accounts. In particular, we advocate the introduction of "account portability" (modeled after the phone number portability in telecommunication) that makes it easy for an investor to switch from one asset manager to another. We are not familiar with the Chilean tax system, but if there is any tax charged at the realization, the transfer of funds from one equity fund to a similar (but cheaper) equity fund should be exempted from any tax, and the accumulated capital gain simply transferred to the new product.

iv. Fostering Competition

As we described in this report, the entry of Fintech asset managers is taking place and can be very beneficial to the system. It is important to ensure that legislation and regulation do not create any impediment, in fact, facilitate, this entry. The suggestions under point iii) go in this sense. In addition, allowing cross-border marketing of managed funds across countries (also known as fund "Passporting") seems very useful and timing. We suggest to extend this passporting to the US firms that have much cheaper products. The Vanguard S&P 500 ETF has only 3bps of fees vs. 250bps of similar products in Chile. A shift from Chilean level of costs to US level of costs would reduce the cost of investing in Chile by US$1.8 billion a year.

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Sirri, E.R. and Tufano, P., 1998. Costly search and mutual fund flows. The Journal of Finance, 53(5), pp.1589-1622.

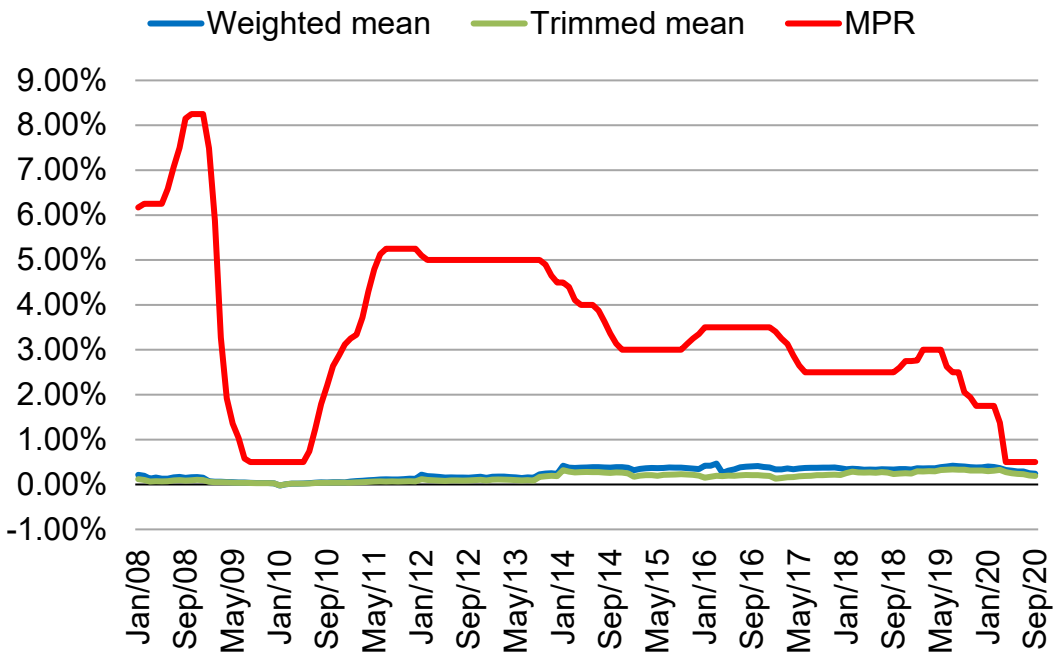
Chapter IV. Analysis of the Bank Deposit Market

1. *Definition of the market*

In Chilean legislation, the concept of deposit covers "all operations, at sight or term, that involve receiving money from the public, whether as a deposit, participation, assignment or transfer of commercial paper or in any other way."[18] The total size of this market at the end of 2020 was US$ 205 billion so composed: 28% demand deposits, 10% other forms of deposits with a maturity of less than a month, 15% term deposits with a maturity between 1 and 3 months, 12% term deposits with a maturity between 3 months and 1 year, and 28% of term deposits with a maturity of more than a year, but the vast majority of these (83%) have a resettable rate. [19]

In what follows we will focus on the two main segments of the market: demand deposits and three-month term deposits as representative of all the term deposits of different maturity. Let's start with the demand deposit. Figure IV.1 plots the demand deposit rate and the MPR since 2008.

Figure IV.1 Demand Deposit Rates and MPR (% per year)



Source: Author's calculations from Central Bank data

[18] https://si3.bcentral.cl/estadisticas/Principal1/Metodologias/EMF/CDC/Depositos_captaciones_sistema_financiero.pdf.

[19] https://si3.bcentral.cl/Siete/ES/Siete/Cuadro/CAP_DYB/MN_ESTAD_MON55/EM_DEP_MN/E31

The trimmed mean is obtaining restricting the sample to banks where deposit commissions represent at least a 2.5% of their commissions. Evert month, we also drop from the calculation the maximum and minimum values.

2. *Prices and Quality*

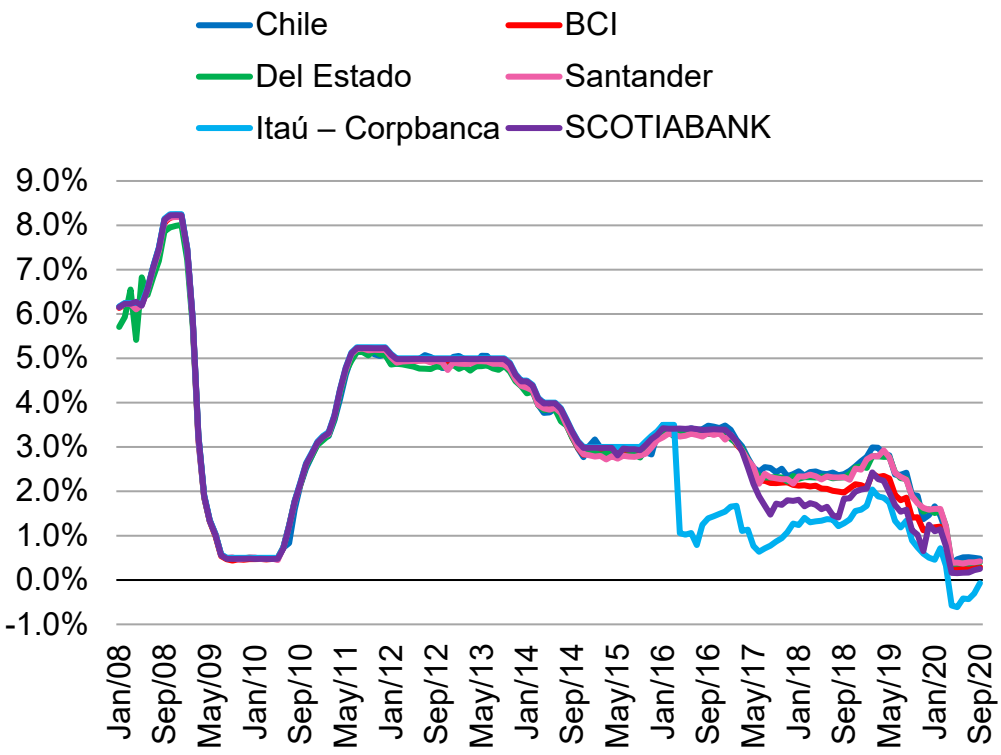
   a. *Price Level*

In accepting a demand deposit, a bank obtains funds that could be withdrawn the next day and in exchange pay a price equal to the demand deposit rate. Since the opportunity cost of funds with the same maturity is given by the monetary policy rate, the banks earn a deposit spread equal to

$$Deposit\ Spread_{i,t} = MPR_t - Deposit\ rate_{i,t}.$$

Figure IV.2 reports the behavior of this spread in the last 12 years for the main banks.

Figure IV.2 Spread between MPR and Demand Deposit Rate
(percentage points)



Source: Author's calculations from CMF data

The deposit rate is obtained by dividing the "demand deposit expenses" (i.e., the interest paid on deposits each month) by the level of demand deposits at the beginning of the month. Since the demand deposit expenses reported in the financial statements are cumulative over the course of the year, to compute the monthly level we take the first difference in the following way:

$$Deposit\ rate_{i,t} = \frac{demand\ expenses_{i,t} - demand\ expenses_{i,t-1}}{demand_{i,t-1}}$$

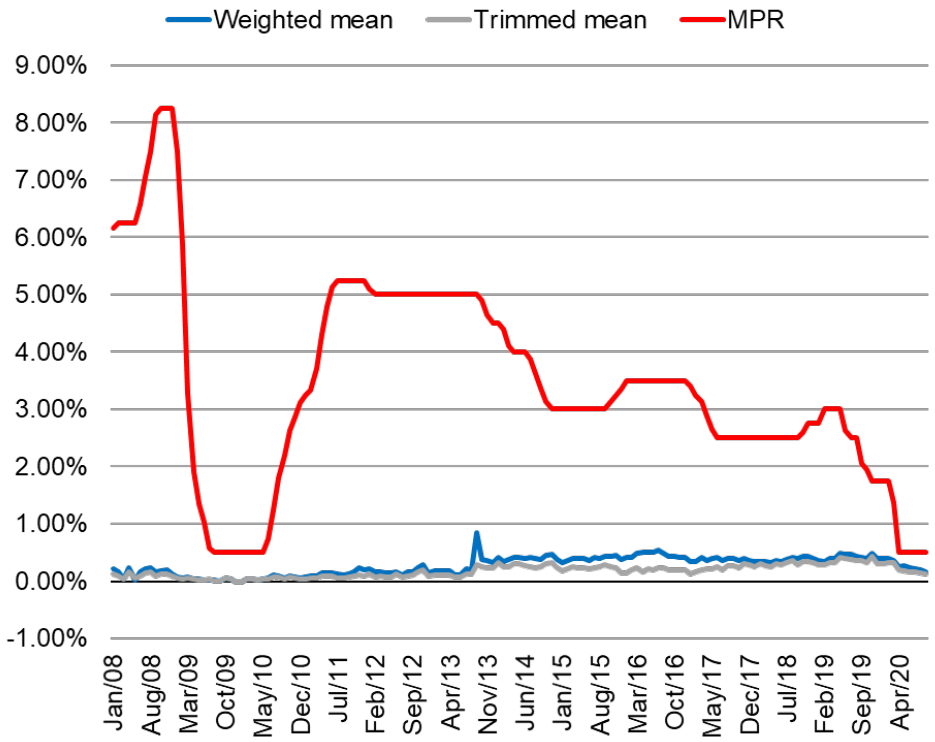
for all the months except January, when the figure reported is the amount for the month.

On average the spread is very large. This is not unique to Chile (see later). In part, this spread is the compensation for the convenience service offered by the branch system. The spread approaches zero when the MPR approaches zero. This is a well-known phenomenon associated with a zero-lower bound in deposits. Banks can (and do) compensate in part by slapping fees, but even these fees do not fully compensate for the lost profits. What is remarkable in Chile is not the existence of this spread, not even the magnitude, but how identical it is across banks for most of the period considered. Only toward the end of the sample period the line for the main 6 banks by market cap does not perfectly coincide. While this coincidence is not a per se sign of collusion, it is hard to imagine this level of synchronicity without some level of (at least tacit) coordination. Interestingly, something seem to have happened in April 2016, which lead to a deviation of the spread of Itau from the rest: Itau increased the demand deposit rate above that of other banks.

To get a better understanding of the causes of these fluctuations of the spread in Figure IV.3 we plot the MPR and average demand deposit rate separately.[20] It is clear that all the fluctuations are due to the MPR. The demand deposit rate is close to zero throughout the entire period.

[20] For the trimmed mean, we only use banks where deposit commissions represents at least a 2.5% of all their commissions. Out of those banks, we eliminate the maximum and minimum values and then take the average.

Figure IV.3: MPR and Average Demand Deposit Rate (% per year)



Source: Source: Author's calculations from CMF data

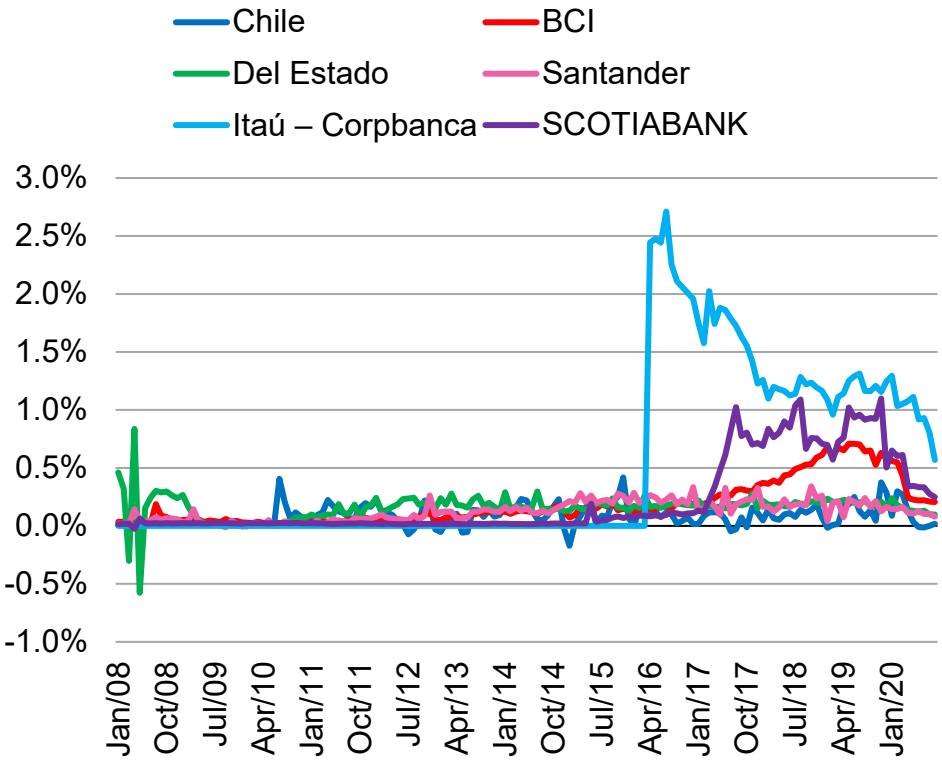
In Figure IV.4 we plot the spread for term deposits, where we use 3-month T-Bill as the term of reference. The term spread is defined as

$$TermSpread_{i,t} = 3MonthsRate_{i,t} - TermRate_{i,t},$$

where $Term\ rate_{i,t} = \frac{Term\ expenses_{i,t} - Term\ expenses_{i,t-1}}{Term_{i,t-1}}$.

Here the picture is very different. First of all, the spread is very small, in fact close to zero for most of the last 12 years. Second, it is more variable across banks. The common elements are a break in April 2016, when Itau-Corpbanca decreased the rates offered to the clientele below that of other banks, increasing substantially the spread. As for demand deposits, the variability across banks remained substantially higher after this event.

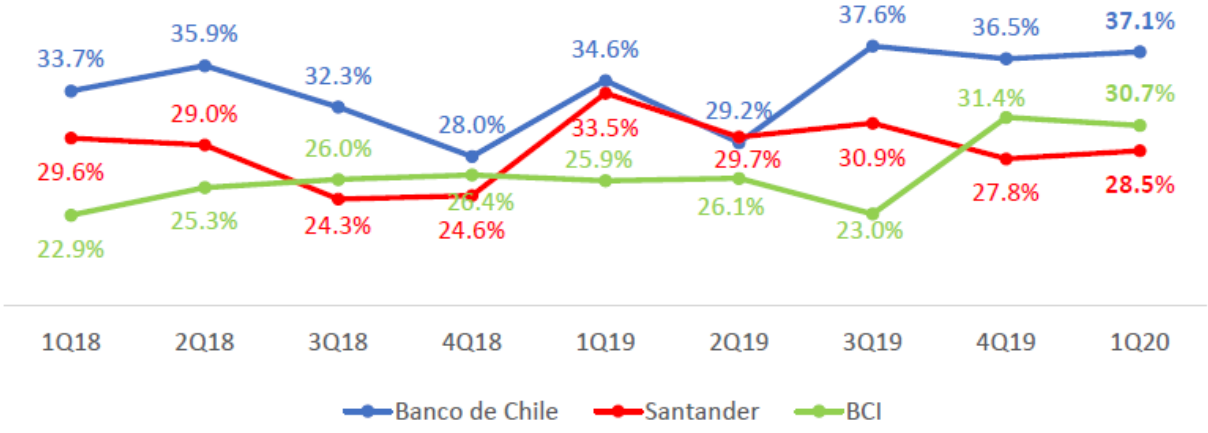
Figure IV.4 Spread between 3-month rate and Term Deposit Rate
(percentage points)



Source: Author's calculations from CMF data

7.1 Quality

Figure IV.5: Net Promoter Score for Higher Income Segment



Source: Ipsos

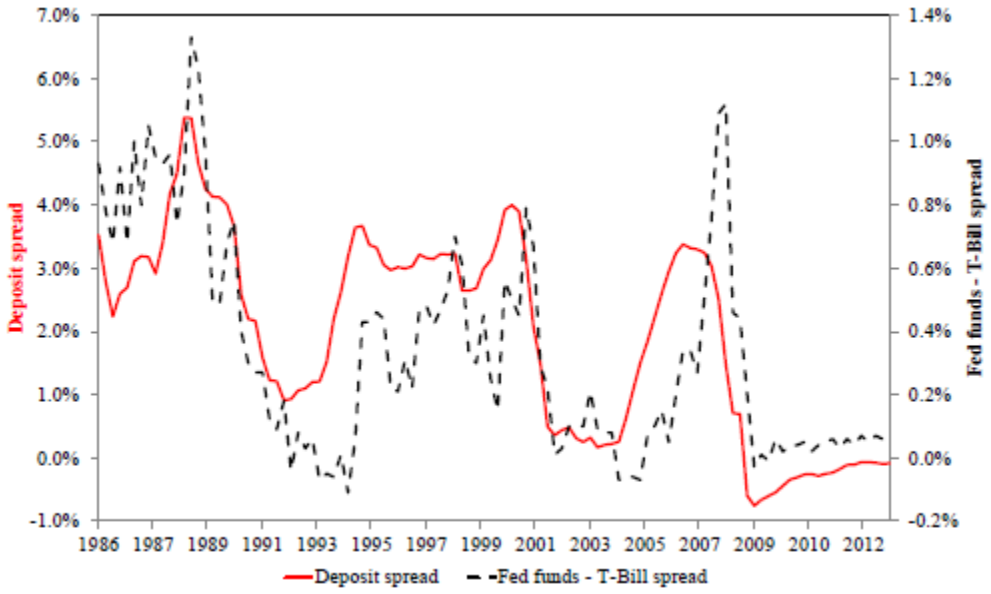
Figure IV.5 reports a graph presented by Banco de Chile in a recent meeting with analysts.[21] From this graph appears that the top three Chilean banks do not differ greatly in terms of customer experience as summarized by the Net Promoter Score (the difference between the proportion of customers who promote a brand and those who detract from it). Thus, difference in quality of customer care does not seem to be important.

7.2 International Comparison

Figure IV.6 reproduces Figure VIII in Drechsler et al. (2017). It plots in red the U.S. aggregate deposit spread, measured as the Fed funds rate minus the value-weighted average deposit rate paid by banks, computed from the quarterly Call Reports. The deposit spread is the equivalent of the Chilean demand deposit spread in Figure IV.2. In addition, Figure IV.4 reports in black the T-Bill liquidity premium, which is equal to the Fed funds rate minus the 3-month T-Bill rate. Drechsler et al. (2017) interpret this finding as evidence of market power by banks. When rates are low, banks face competition from cash, which forces them to keep the spread on deposits low. When rates are high, banks' competition is mainly from other banks, which allows them to let the spread increase, without losing too many deposits. If this effect is due to market power, it is likely to manifest itself more in more concentrated markets. Indeed, they find that when the Fed funds rate rises, branches located in more concentrated markets raise their deposit rate less and thus raise their spread by more, and experience greater outflows, than branches located in less concentrated markets.

[21] https://portales.bancochile.cl/uploads/000/009/277/8ad22464-d063-43e2-a213-6b46b02e006e/original/1Q20-Webcast-Presentation_vf2.pdf

Figure IV.6: Deposit Spread in the United States

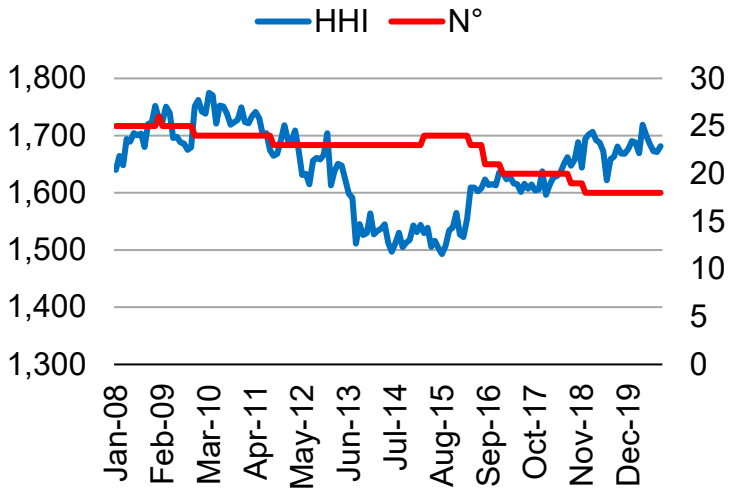


Source: Drechsler et al. (2017).

3. *Concentration Measures*

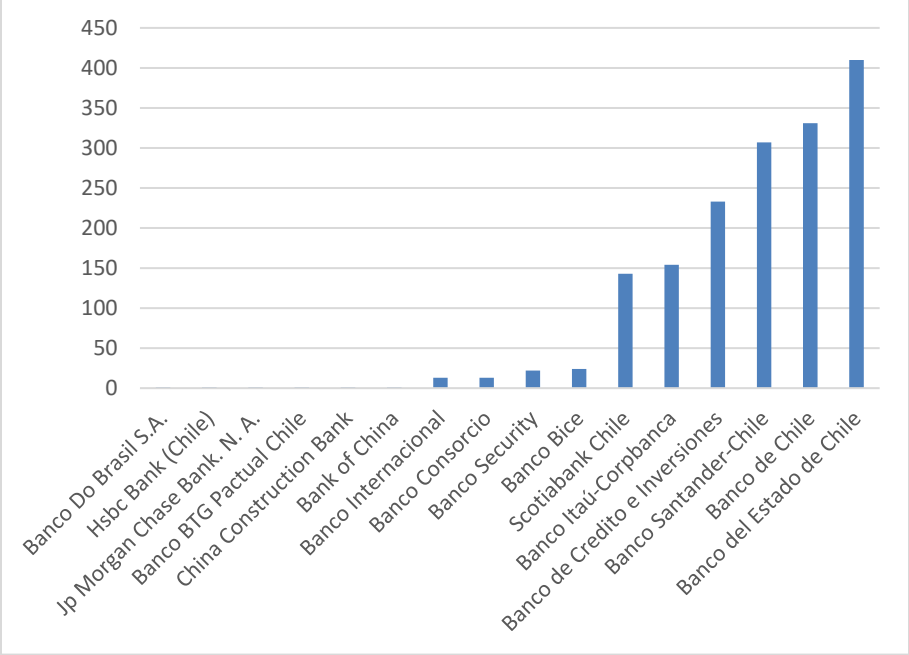
As usual, we start by looking at the HHI index for demand deposits and the number of banks present during the last 12 years (Figure IV.7). The HHI oscillates around 1700 and the number of banks between 20 and 25. Thus, concentration is not at worrisome level. Not all the banks, however, take demand deposits and, most importantly, not all banks have the branch network to effectively compete in this market (at least until online banking takes over). While the importance of the branch network is slowly fading, to understand the concentration of deposits we should look at the concentration of bank branches. As Figure IV.8 shows, there are four major bank branch network in Chile with a number of branches between 230 and 410: Banco Estado, Banco de Chile, Santander, and BCI. There are two runner up network with roughly 150 branches: Scotiabank and Banco Itau-Corpbanca. All the other banks have very few or no branches.

Figure IV. 7: Herfindahl–Hirschman Index of the Market for Demand Deposit



Source: Author's calculations from CMF data

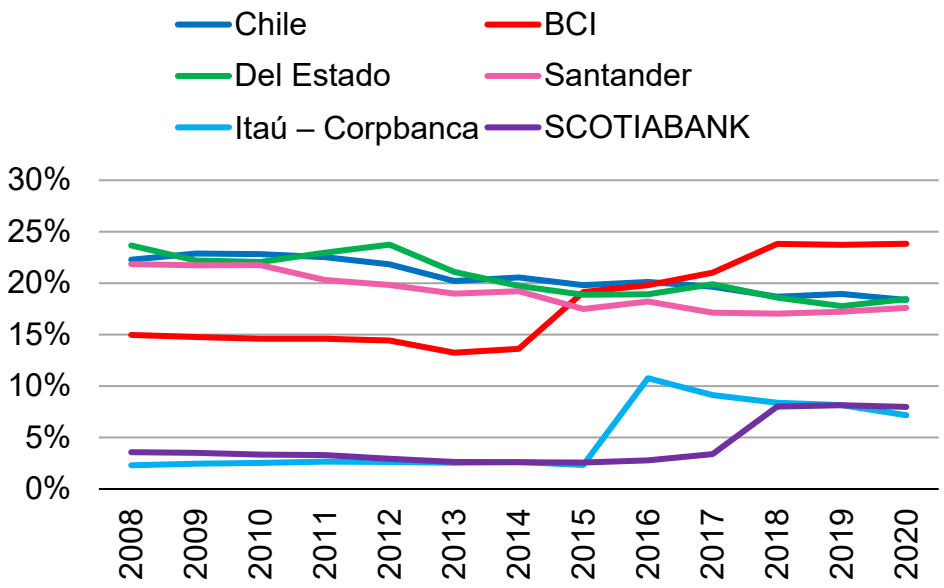
Figure IV. 8: Number of Branches per Bank in 2020



Source: CMF

Bank's market share of demand deposits perfectly reflects the size of their branch network, as we can see from Figure IV.9: the four banks with the largest branch network control between 15 and 25% of the demand deposit each

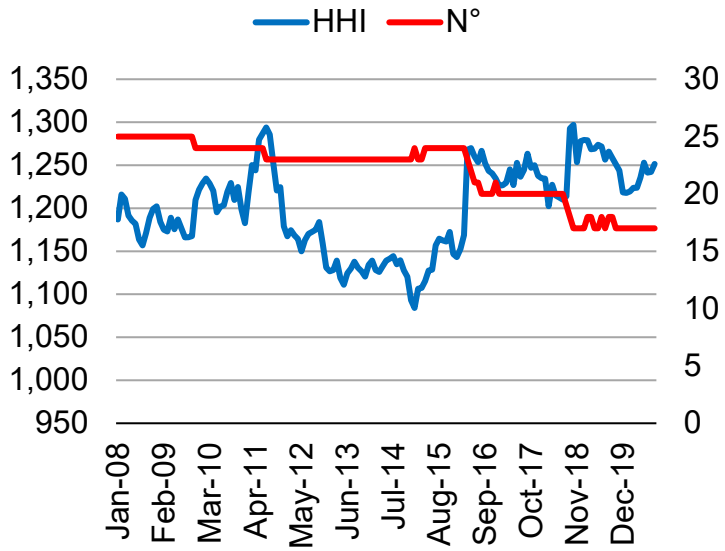
Figure IV. 9: Market Share of Largest Banks in the Demand Deposit Market (% of total)



Source: Author's calculations from CMF data

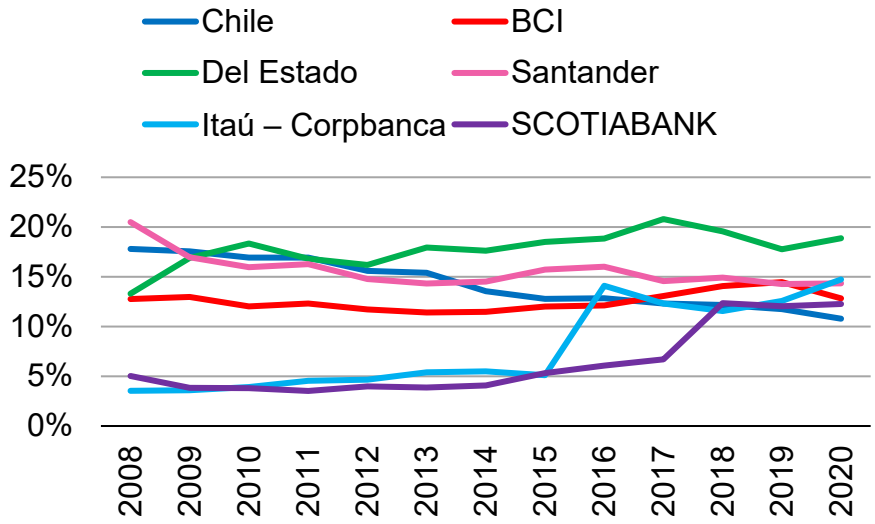
The story is similar for term deposits (Figure IV. 10 and Figure IV. 11). Towards the end of the sample, however, the difference between the big four banks and the two runner ups disappears: they all have market share between 10% and 15%. This explains why the HHI is relatively low.

Figure IV. 10: Herfindahl–Hirschman Index of the Market for Term Deposit



Source: Author's calculations from CMF data

Figure IV. 11: Market Share of Largest Banks in the Term Deposit Market (% of total)



Source: Author's calculations from CMF data

4. Competition measures

Figure IV. 12: Aggregate Lerner Index

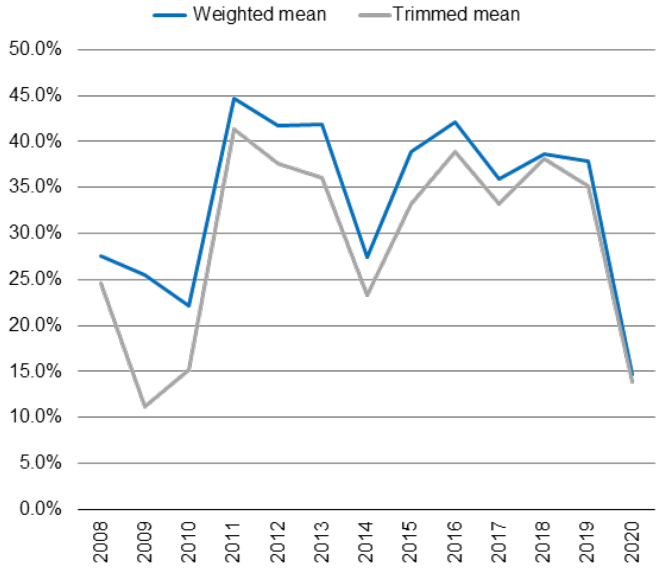


Figure IV.12 reports the aggregate Lerner Index computed for the entire deposit market. The assumption here is that the marginal cost of the product deposit is the rate paid on deposits and the price is the MPR. The margin computed here is a weighted average of the demand deposit

margin (which is very high) and of the term-deposit margin (which is close to zero) according to the following formula:

$$\text{Agregate Lerner index} = \frac{demand\ spread * demand\ + 3M\ spread * term\ + commissions}{MPR * demand + Secondary\ market * term\ + commissions}$$

Except for the two crises periods (post 2008 and post Covid), the margin oscillates between 25% and 40%. The periods of near-zero MPR reduce this operating margin greatly.

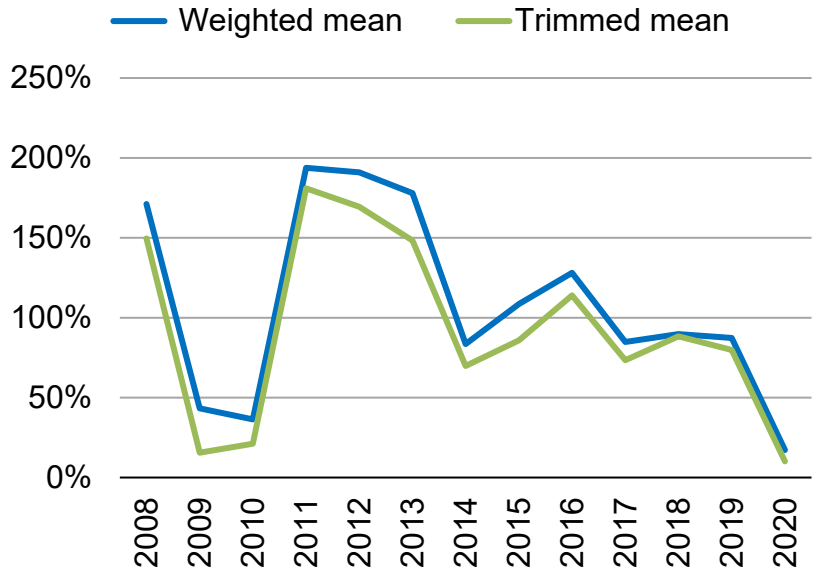
5. *Profitability*

Banks do not disclose their financial statements by the line of business, so it is not possible to compute the profitability of the deposit segment as different from the profitability of the bank as a whole. Yet, we can calculate the benefits the banking sector as a whole derives from its ability to obtain deposits at a zero interest rate. This benefit can be obtained as the product of the average demand deposit balance times the spread on demand deposit. Over the last ten years, the average benefit for all the demand deposit banks was CLP662bn a year,

This benefit is not necessarily a monopoly rent. Only banks with a large branch network seem to be able to attract large demand deposits. Thus, we can think about the branch network as the price that they have to pay to enjoy this rent. At the end of 2020, there were 1,788 bank branches in Chile. Thus, on average each branch was producing CLP370M (US$463K). Thus, if the equivalent annual cost of running a branch (given by the sum of operating expenses and the annual cost of the capital investment needed) is below CLP370M, banks are more than compensated for the cost of the network, so they are earning a monopoly rent.

Another way to look at the profitability of deposits vis-à-vis the cost of supporting them is to divide the spread made in deposits (and the relative commissions) by the total administrative costs of a bank as if the total administrative costs were paying entirely for deposits. This is what we do in Figure IV.13. Except for the crisis periods, the deposit spread covers 100% of the administrative cost of the banks.

Figure IV.13 Net Spread Revenues as % of Administration Costs



6. *Evidence of Market Power if Any and Possible Sources*

During the period 2008-2016, it is difficult to explain the total insensitivity of deposit rates to the MPR without some degree of market power of the main banks, as also recognized by Drechsler et al. (2017). Interestingly, this sensitivity starts to manifest itself only after the 2016 merger between Itau and Corpbanca, which upsets the pre-existing equilibrium.

The fact that banks continued to offer demand deposits even when the spread, compressed by the zero lower bound, approached zero, confirms that the marginal cost of supporting those deposits was not very high, certainly not as high as the CLP662bn a year that deposit banks collectively make. The only justification would be that that benefit is the required compensation to support the building of the bank branches. Yet, it seems high, especially at a time when branches are closing and they are not as crucial as they used to be to collect deposits.

7. *Recommendations*

The entry and diffusion of online banks is likely to challenge the position of incumbent deposit banks anyway. Thus, no particular actions by the government need to be undertaken. The other technological change that might help reduce the seigniorage currently captured by banks is the development of a central bank digital currency (CBDC). If Chile were to go down the path of

granting citizens access to deposits at the central bank, the State would be able to appropriate most of the seigniorage currently captured by banks. Of course, there are many pros and cons of the CBDC solution, which are outside the scope of this report. If you are interested, however, we will be happy to develop this suggestion further.

References for Chapter IV

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